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**US Army Corps  
of Engineers**

**New Orleans District**

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**CULTURAL RESOURCES SURVEY OF THE MRGO  
DREDGED MATERIAL BAYOU LA LOUTRE  
DISPOSAL AREAS, ST. BERNARD PARISH,  
LOUISIANA**

**Final Report**

**October 1998**

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**Prepared for**

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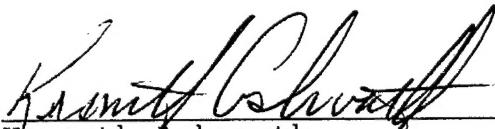
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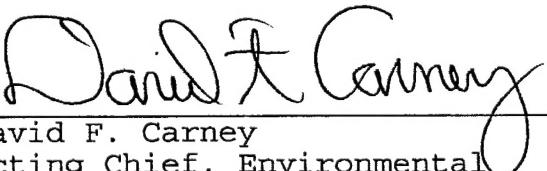
Planning, Programs, and  
Project Management Division  
Environmental Planning  
and Compliance Branch

### To the Reader:

This cultural resources effort was designed, funded, and guided by this office, as part of our cultural resources management program. Documented in this report is a cultural resources investigation of two disposal areas of the Mississippi River-Gulf Outlet, in St. Bernard Parish, Louisiana. Dredged material from the Mississippi River-Gulf Outlet is to be used to nourish and recreate the marsh environment in the area.

The cultural resources survey did not locate any archaeological sites. This office and the Louisiana State Historic Preservation Officer concur with the contractor's conclusion that no cultural remains will be impacted by the planned dredge disposal. No additional cultural resources work is necessary.

  
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Contracting Officer's  
Representative

  
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<p>This report presents the results of cultural resources investigations by Earth Search, Inc. (ESI), for two dredged material disposal areas, totalling approximately 500 acres, of the Mississippi River Gulf Outlet in St. Bernard Parish. Dredged material is scheduled to be deposited in Sites 18 and 18a in an attempt to nourish and recreate the marsh environment. A portion of Site 18 was surveyed using systematic shovel tests to locate cultural resources. The remainder of Site 18 and all of Site 18a were accessed by airboat, and auger tests were judgmentally placed in the marsh. A visual inspection of all exposed banklines was also conducted. No cultural remains were encountered during survey of Disposal Sites 18 and 18a. No historic or prehistoric archeological sites will be impacted by the planned dredge disposal. No standing structures are present in the survey area. No further work is recommended.</p>				
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## **CHAPTER 1 INTRODUCTION**

Earth Search, Inc., performed a cultural resources survey of two dredged material disposal areas for the Mississippi River Gulf Outlet (MRGO) in St. Bernard Parish under contract to the New Orleans District, U.S. Army Corps of Engineers. Dredged material is scheduled to be deposited in Sites 18 and 18a (Figure 1) in an attempt to nourish and recreate the marsh environment. Prior to the current investigation, the two disposal sites had not been surveyed for cultural resources.

In 1979, a cultural resources survey was conducted of the entire Mississippi River Gulf Outlet (Wiseman et al. 1979). That earlier survey included existing disposal areas on the west bank of the MRGO. However, new disposal areas have been proposed as part of an effort to deposit dredged material in areas where erosion is rapid, thereby benefiting coastal marshes.

A portion of Site 18 was surveyed using systematic shovel tests to locate cultural resources (Figure 1). The remainder of Site 18 and all of Site 18a were accessed by airboat, and auger tests were judgmentally placed in the marsh (Figure 2). Site files housed at the Louisiana Division of Archeology showed that no archeological sites had been reported in these areas previously, and no archeological sites were recorded during the course of survey.

### **Report Organization**

Chapter 2 provides an environmental overview of the region. Chapters 3 and 4 present discussions of the prehistory and history of St. Bernard Parish, respectively. Chapter 5 summarizes the previous archeological investigations in the vicinity of the project area. Chapter 6 provides a discussion of field methodology and the results of field investigations. Recommendations are presented in Chapter 7.

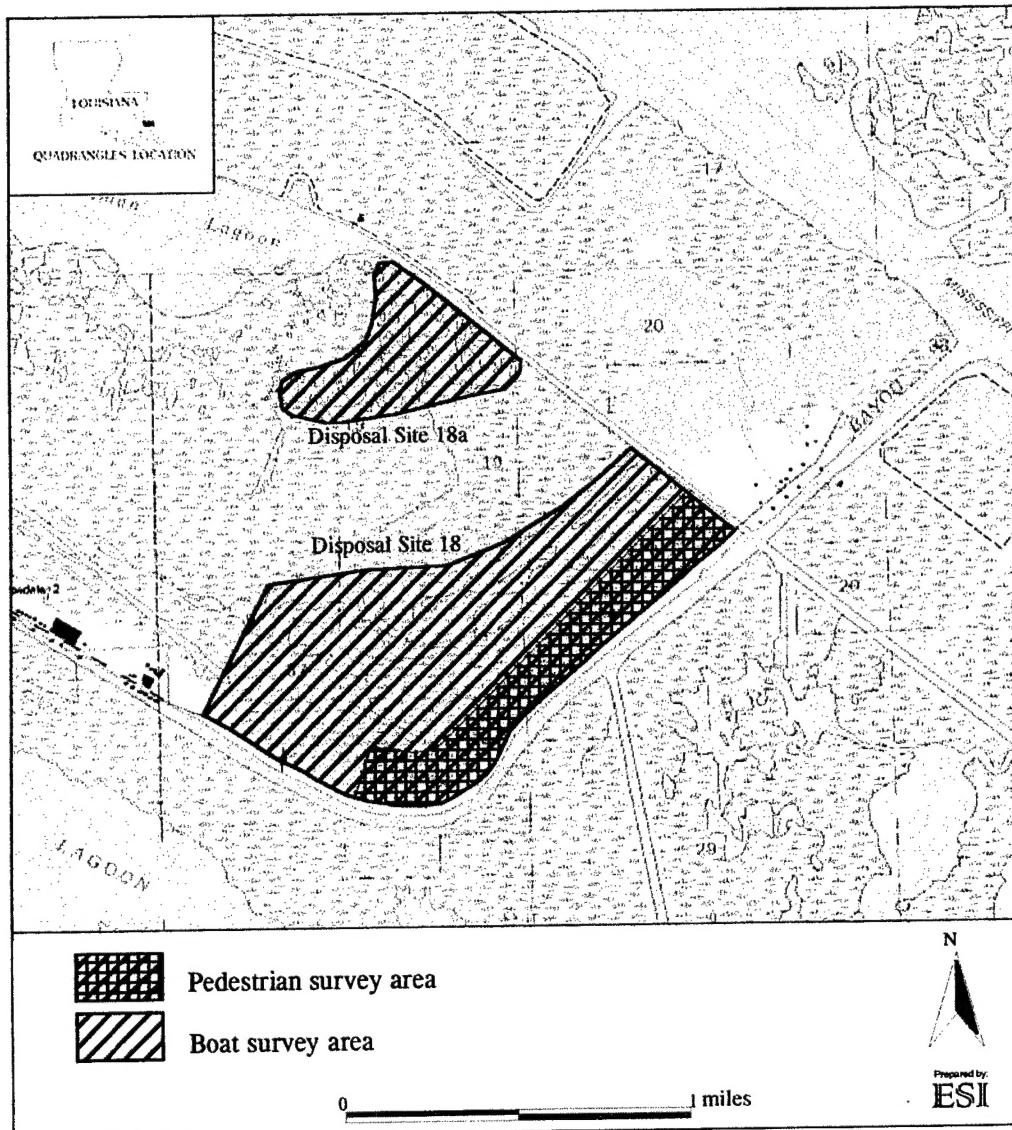


Figure 1. Excerpts from the Yscloskey and Lena Lagoon 7.5' USGS quadrangle showing the study area.

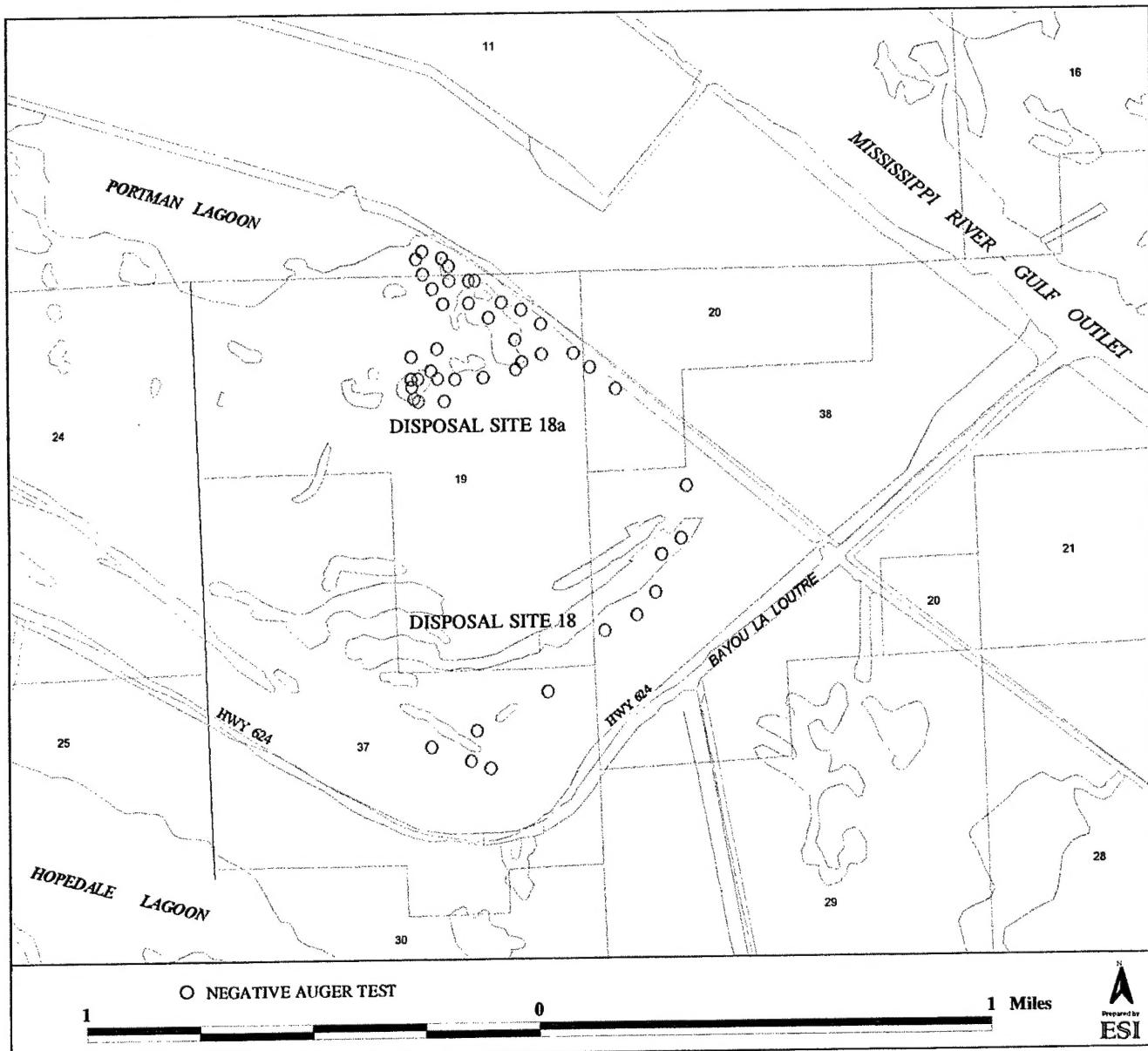


Figure 2. Locations of auger tests.

## CHAPTER 2

### NATURAL SETTING

#### Overview and Present Condition

The total area of St. Bernard Parish encompasses approximately 1.3 million acres. However, approximately 75 percent of that acreage is occupied by streams, lakes, and bays of the Gulf of Mexico. Much of the remainder of the parish is occupied by swamps and marshes. As a result, most of the parish's population is concentrated along natural levees associated with the Mississippi River, Bayou La Loutre, and Bayou Terre aux Boeufs because these landforms are slightly higher than the surrounding wetlands. Natural levees of the Mississippi River and its distributaries represent approximately ten percent of the parish's land area. Most of this acreage is now developed for urban use. Even some of the marshes and swamps have been drained for urban development because of the shortage of suitable land (Trahan et al. 1989:1). In the eighteenth and nineteenth centuries, however, large portions of the natural levees, especially those along the Mississippi River, were used for plantation agriculture.

Topographic relief in St. Bernard Parish is minimal. The highest elevations are approximately twelve feet above sea level. These occur on natural levees associated with the Mississippi River. The lowest elevations are about three feet below sea level, and these generally occur within former marshes and swamps that have been drained. Most of the undrained swamps and marshes are elevated about one foot above sea level. Because the parish is so low, and because of the extensive shoreline associated with lakes, bays, and the Gulf of Mexico, human-made levees are necessary to protect developed areas from flooding (Trahan et al. 1989:1).

#### Geomorphology

Louisiana's deltaic plain, which includes all of St. Bernard Parish, was created by progradation of a series of Mississippi River courses and deltas. The Mississippi River has repeatedly built major delta lobes, and these were subsequently abandoned. After abandonment, marine transgression occurred due to compaction and subsidence. In recent times, human activity has accelerated the rate of land loss. Prior to that activity, there was an overall gain in the size of the coastal plain in southeast Louisiana (Britsch and Dunbar 1990:25-26).

The first stage of delta formation is progradation. During this stage, a stream deposits sediment into a standing body of water. Distribution of flow results in a natural sorting of sediment according to particle size. Because of the deposition of sand at the shallow, wide mouth of the prograding stream, middle-ground bars form. These result in the bifurcation of channels and the initial formation of a distributary network. Eventually, one channel is usually favored (Frazier 1967:288).

Natural levees form along the channels as the result of deposition of sediment suspended in floodwaters. Progradation continues until eventually a channel is "overextended" and diversion into an alternate course with a steeper, hence more favorable, gradient occurs. The delta lobe associated with the formerly favored course now begins to subside as underlying clays are compacted and the amount of surface deposition is reduced. Delta margins begin to be reworked by wave action, and sand that had been deposited at the mouth of the formerly favored stream accumulates as barrier islands. Eventually, the abandoned distributary may be re-activated, and the result is a repetition of the sequence (Frazier 1967:288, 291).

During the past 7,000 years, a series of delta complexes formed. These complexes, beginning with the oldest, were the Maringouin, Teche, St. Bernard, Lafourche, and the Plaquemine-Modern. The locations of the complexes are shown in Figure 3 (Frazier 1967:289) and the location of the lobes of which each complex is comprised in Figure 4 (Frazier 1967:307). The estimated ages of these complexes and lobes are shown in Figure 5 (Frazier 1967:308).

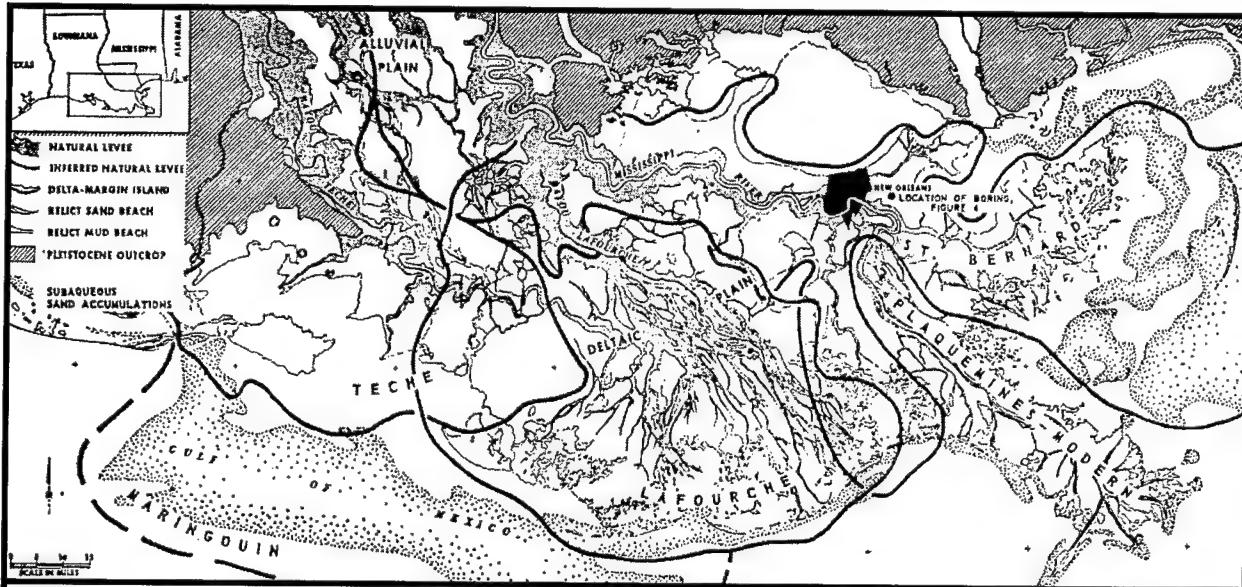


Figure 3. Outlines of the Mississippi River delta complexes (from Frazier 1967:Figure 1).

Figure 6 shows the location of a line of borings (E-E') from which Frazier (1967) obtained data concerning the formation of the St. Bernard Delta Complex. The line runs southeast from New Orleans, close to the shore of Lake Borgne, crossing a series of distributaries associated with Bayou La Loutre. After crossing Bayou La Loutre, the line of borings continues into the Chandeleur Sound.

The earliest stage of natural levee formation in the vicinity of Bayou La Loutre occurred during the period of activity of Delta Lobe 3 (the Mississippi River and Bayou Lafourche Lobe) approximately 4700 years ago. Sediments associated with this episode are now deeply buried.

Aggradation of the natural levee of Shell Beach Bayou occurred again while Delta Lobe 8 (the Mississippi-La Loutre Lobe) was active, approximately 3000 to 2300 B.P. Deposition contin-

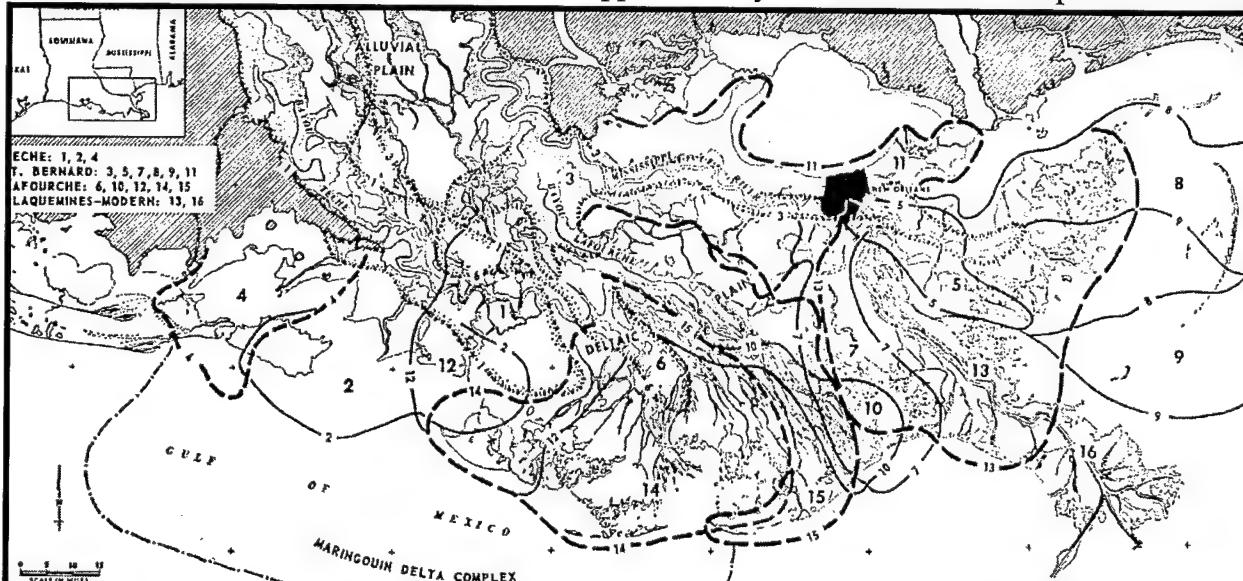


Figure 4. Delta lobes formed by the Mississippi River in the past 6,000 years (from Frazier 1967:Figure 11).

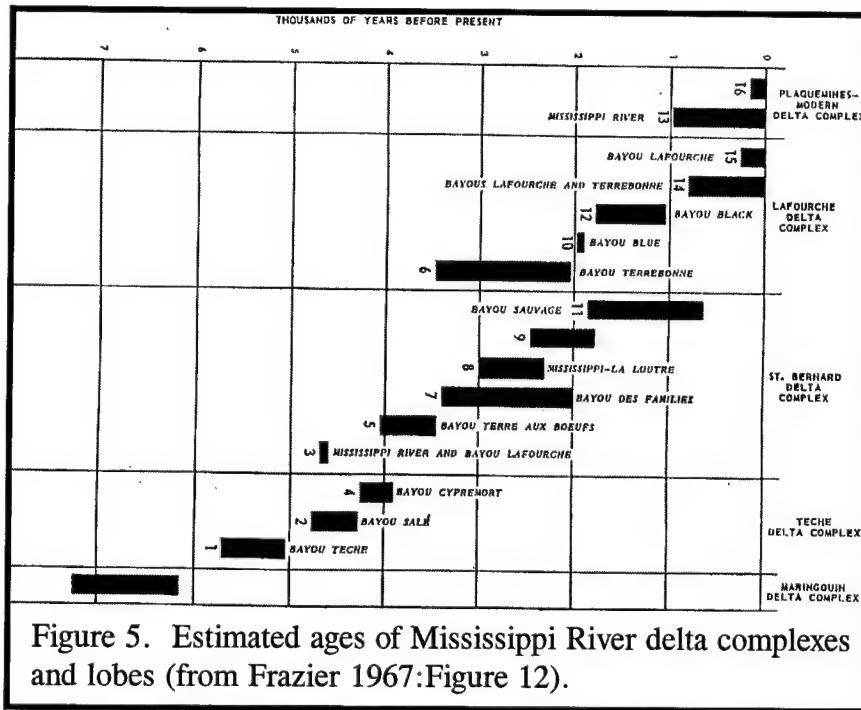


Figure 5. Estimated ages of Mississippi River delta complexes and lobes (from Frazier 1967:Figure 12).

portion of the natural levee formed in that period is at or within five feet of the present-day surface, buried in some places only by accumulations of peat. It was during this period of activity that the St. Bernard delta was extended eastward (Frazier 1967:306) beyond the present-day Chandeleur Islands (Figures 4 and 7).

Saucier (1963) suggested that Native Americans in southeastern Louisiana occupied natural levees associated with channels that had already achieved maximum development and were partly abandoned. He hypothesized that the lower reaches of partially abandoned streams were

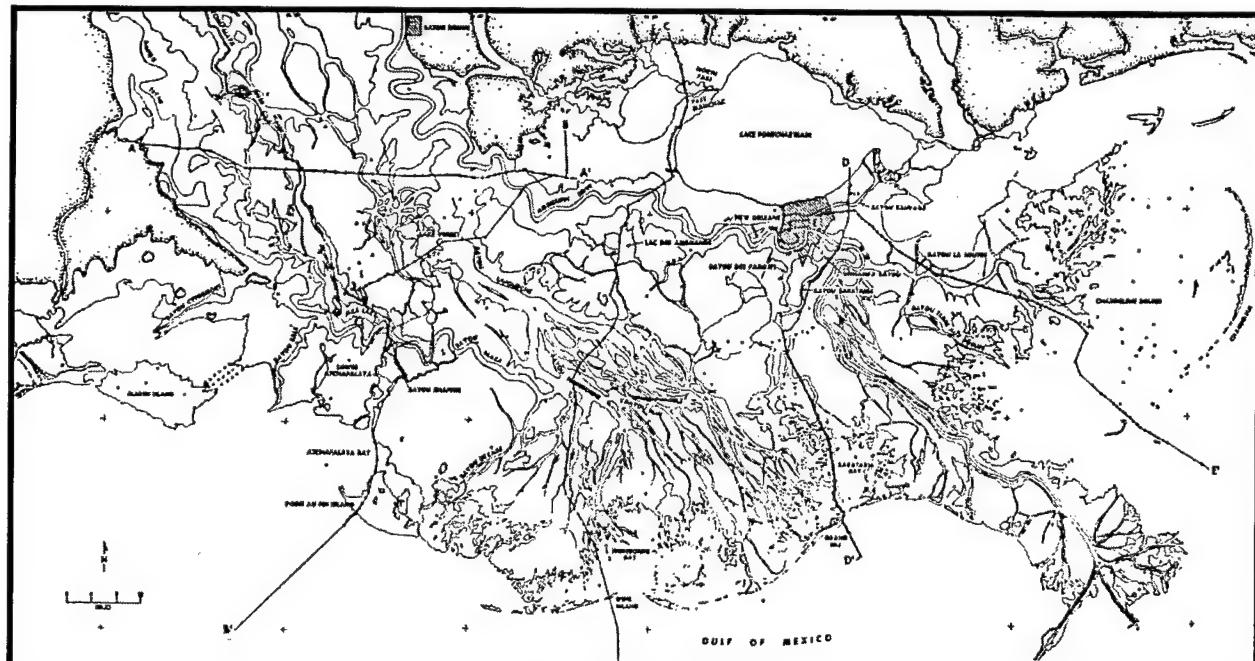


Figure 6. Location of cross sections and principal control borings used by Frazier to reconstruct the Mississippi River delta formation (from Frazier 1967:Figure 5).

ued here during the active period of the unnamed Delta Lobe 9, which ended about 1800 B.P. Following that period of activity, only minor amounts of sediment were deposited in the vicinity of the present study area. However, peat accumulated as marsh vegetation flourished (Frazier 1967:306).

Sediment associated with Lobe 8 lies at depths of approximately 10 to 20 ft. For Lobe 9, depths are approximately 5 to 15 feet. The period of activity of greatest duration, coincident with the activity of Lobes 8 and 9, was from approximately 3000 to 1800 B.P. The highest portion

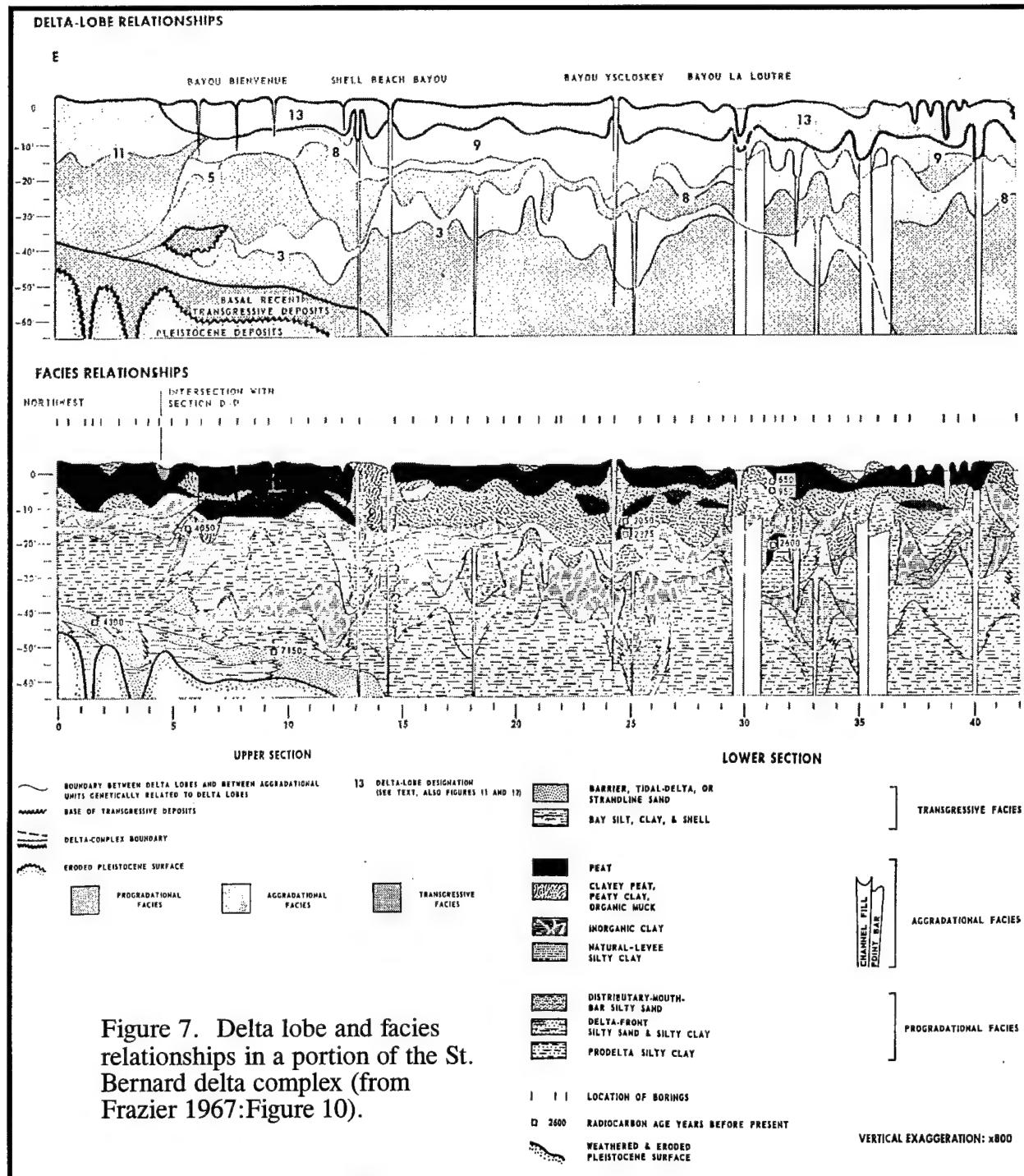


Figure 7. Delta lobe and facies relationships in a portion of the St. Bernard delta complex (from Frazier 1967:Figure 10).

desirable site locations because flood frequency was lower, fresh water was available, and the location allowed convenient access to swamps, marshes, and fresh to brackish water lakes.

## Hydrology

Prior to the construction of artificial levees, water from the Mississippi River flowed into the wetlands through distributary channels. These channels also carried rainwater. Because slopes are so gentle, this water as well as sheet flow that resulted from flood conditions moved gradually into and through the swamps and marshes. Movement of water was further slowed

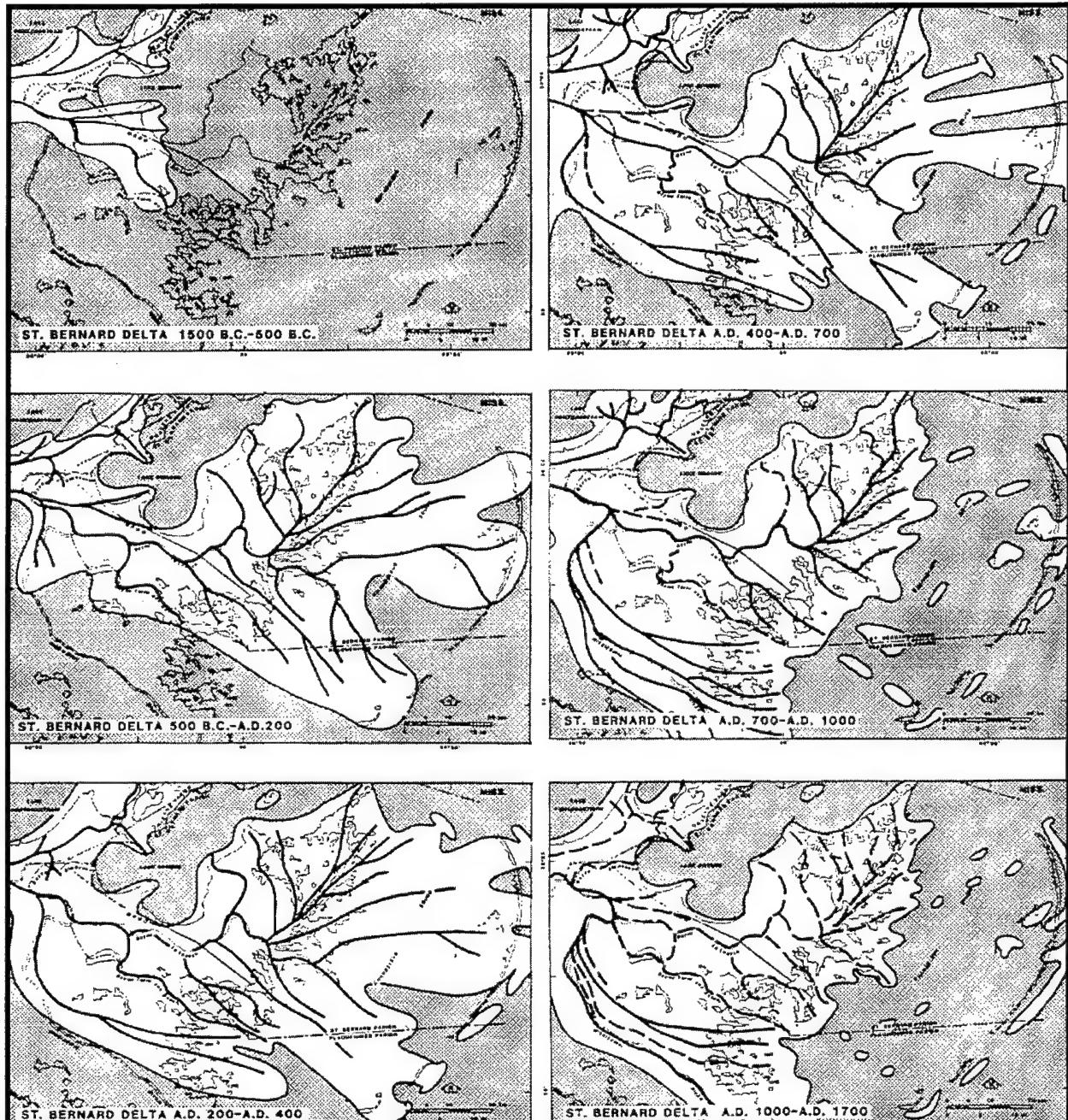


Figure 8. Reconstruction of the formation of the St. Bernard delta complex (from Wicker et al. 1982:Figure 2/1).

because many of the interdistributary channels were shallow and winding, and because of the effects of wetland vegetation. Fresh water was thus released gradually into the tide waters. As a result, the hydrologic environment, specifically water levels and salinity values, in the shorter term were relatively stable (Trahan et al. 1989:3). More long term changes in water levels, salinity values, and the location of land masses occurred as the result of changes in the pattern of flow of the Mississippi River.

Modern development within the parish has dramatically altered the hydrologic environment. The rate of land loss due to erosion and subsidence has been accelerated. In addition,

construction of large numbers of canals, and in particular the Mississippi River Gulf Outlet, has resulted in saltwater intrusion. Freshwater swamps and marshes have virtually disappeared.

## Soils

Disposal Site 18 is comprised of Fausse soil (Trahan et al. 1989:Sheet 56). Frequently covered by saltwater, this soil is located in swamps on subsided Mississippi River distributary natural levees. Slope is less than 1 percent, with water table fluctuation from 1 foot above surface to 1.5 feet below ground surface.

Disposal Site 18a is comprised of Clovelley muck (Trahan et al. 1989:Sheet 56). This soil is located in brackish marshes, very poorly drained, fluid, and slightly saline. Clovelley soils are wet throughout the year and have a slope of less than 1 percent (Trahan et al. 1989:13). Primarily, this soil is used as a habitat for wetland wildlife and for recreation, such as hunting and fishing.

## Climate

St. Bernard Parish is located within the subtropics. Its weather is strongly influenced by the Gulf of Mexico. Winters are relatively mild. The average winter temperature is 54° F, while the average daily minimum temperature in the winter is 44° F. Summers, however, are hot with an average temperature of 81° F and an average daily maximum temperature of 90° F (Trahan et al. 1989:1-2).

The average annual rainfall is 59 inches. Fifty-six percent of the total falls in April through September, a period that coincides with the growing season for most crops suitable for the parish. Rainfall amounts can be considerably increased when hurricanes occur (Trahan et al. 1989:2).

## Plant Communities

Prior to cultivation, urbanization, and modification of its hydrology, diverse plant communities were present in St. Bernard Parish. Although the difference between elevations of the various landforms is minimal, these slight differences were associated with the development of distinctively different plant communities. One of these, and perhaps that of the most limited extent, was an "upland forest" found only on the highest natural levees. On natural levees with lower elevations, a "hardwood bottoms" community was present. Also following the course of the natural levees but occurring at lower elevations were the "cypress-tupelo" forests. An intermediate swamp was sometimes located between these two communities. Large tracts of marsh occur in the surrounding areas (White et al. 1983:102).

Prior to cultivation and urbanization, upland forests occupied most of the natural levee associated with the river itself. Similar plant communities remain present on the Pleistocene terrace north of Lake Pontchartrain. Natural climax vegetation in such forests is dominated by mixed deciduous and evergreen trees that are less tolerant of flooding than are bottomland hardwood species. Woody species in an elevated natural levee forest included oaks (*Quercus virginiana*, *Q. alba*, *Q. nigra*), shagbark hickory (*Carya ovata*), hackberry (*Celtis laevigata*), sweetgum (*Liquidambar styraciflua*), pecan (*Carya illinoiensis*), magnolia (*Magnolia spp.*), and various pines (Bahr et al. 1983:82).

Hardwood bottom forests were dominated by the water oak (*Quercus nigra*). Subdominants included the sweetgum (*Liquidambar styraciflua*), hackberry (*Celtis laevigata*), and live oak (*Quercus virginiana*). Other forest species include the box-elder (*Acer negundo*), honey-locust (*Gleditsia triacanthos*), American elm (*Ulmus americana*) and the Nuttall oak (*Quercus nuttallii*).

The most common shrub species were palmetto (*Sabal minor*) and green haw (*Crataegus viridis*), but thickets of possum-haw (*Ilex decidua*) also occur. Within forest gaps, elderberry (*Sambucus canadensis*) and French-mulberry (*Callicarpa americana*) occurred (White et al. 1983:103-104).

Vines were found throughout the bottomland forest. The most common of these included poison ivy (*Rhus toxicodendron* var. *vulgaris*), Virginia creeper (*Parthenocissus quinquefolia*), supple-jack (*Berchemia scandens*), pepper-vine (*Vitis rotundifolia*), muscadine (*Vitis rotundifolia*) and hemp-weed (*Mikania scandens*) (White et al. 1983:104).

The cypress-tupelo swamps, located a greater distance from distributaries, were dominated by bald cypress (*Taxodium distichum*). Water tupelo (*Nyssa aquatica*) was often either a sub- or co-dominant species. Red maple (*Acer rubrum* var. *drummondii*) and ash trees (*Nyssa aquatica*) represented the other sub-dominants in this community. Shrubs included wax-myrtle (*Myrica cerifera*) and button-bush (*Cephalanthus occidentalis*). Herbaceous ground cover, absent in the bottomland community, included smart-weed (*Persicaria punctata*), alligator-weed (*Alternanthera philoxeroides*), swamp potato (*Sagittaria lancifolia*), and water hyacinth (*Eichhornia crassipes*) (White et al. 1983:105).

An intermediate swamp forest sometimes occurred between the hardwood bottom forest and the swamp forest. Swamp red maple, American elms, and water oaks were common here. Palmettos created a dense understory, which is nearly impenetrable in some locations (White et al. 1983:105).

The other important plant community occurred in the marsh areas. Marshes are categorized according to their degree of salinity, and because of variation in fresh water influx compared to salt water intrusion, the areas covered by the various marsh communities certainly changed through the period of prehistoric occupation. The changes were associated with cycles of progradation and deterioration of natural levees.

The ecological distinction between a swamp and a marsh is the absence of trees in the latter. Marsh soils are peat and muck, and elevation of these is approximately one foot above mean sea level in the vicinity of the study area. Cord grass (*Spartina patens*) is dominant in the brackish or intermediate marsh, while swamp-potato (*Sagittaria lancifolia*) predominates in freshwater marsh. Numerous other species co-occur with these (White et al. 1983:106-107).

## Faunal Resources

Important fur-bearing species present within or near the study area were the muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), mink (*Mustella vison*), and otter (*Lutra canadensis*). Nutria (*Myocastor coypus*) are a recent introduction and were not present during the prehistoric or historic periods.

Other indigenous mammals known to occur in the area included the Virginia opossum (*Didelphis virginiana*), the swamp rabbit (*Sylvilagus aquaticus*), the fox squirrel (*Sciurus niger*), the fox (*Vulpes fulva*), the bobcat (*Lynx rufus*), the beaver (*Castor canadensis*), the civet cat or spotted skunk (*Spilogale putoris*), and the white-tailed deer (*Odocoileus virginianus*) (Bahr and Hebrard 1976:118-126). The mammalian faunal inventory was even more extensive during the prehistoric period (Speaker et al. 1986:26-29).

The area also hosted a diverse assemblage of species of fish. They are highly mobile, and seasonal movements of fish populations are widespread. The result is that marine fish would have penetrated inland to freshwater habitats, while freshwater species would sometimes have occurred in more saline environments. Also, the lower reaches of freshwater streams probably served as nursery areas for the young of some marine species (Bahr and Hebrard 1976:69).

At least 26 reptilian species were native to the area. The American alligator (*Alligator mississippiensis*) and various species of turtle were common, and undoubtedly represented the most economically important reptiles for prehistoric peoples (Bahr and Hebrard 1976:74-77).

Birds were also abundant. In the nearby Barataria Basin, at least 216 species are known to occur at present. Approximately 43 percent of these are passerines, including both permanent residents and those only present seasonally. The remainder of the 216 species are predominantly waterfowl, many of which are migratory (Bahr and Hebrard 1976:6-7,78-115).

## CHAPTER 3

### ABORIGINAL OCCUPATIONS IN SOUTHEASTERN LOUISIANA

Few sites dated to the Paleo-Indian or Archaic periods have been reported in southeastern Louisiana. Land formation within what would become St. Bernard Parish was not occurring until the Poverty Point period (Chapter 2), so it is with this period that the current review begins. Table 1 present the culture periods discussed in this chapter.

#### The Poverty Point Period

The name “Poverty Point” is derived from the type site (16WC5), an area of massive earthwork construction in northeastern Louisiana. This site is believed to have been a cultural center with trade networks and influence extending throughout the Lower Mississippi Valley. Baked clay balls known as “Poverty Point objects” are one of the important traits that mark the period. Other traits include an elaborate lapidary and microlithic industry, use of steatite vessels, and the use of exotic stone (Thomas 1982:5).

Two Poverty Point sites and a possible third are located within the land area formed by the St. Bernard Delta Complex. One of these, the Linsley site (16OR40), is in Orleans Parish. Material dredged from this subsided *Rangia* midden was used to define the Bayou Jasmine-Garcia phase of the Poverty Point culture (Gagliano et al. 1975:44-47). A series of radiocarbon dates and baked clay balls are evidence that link the site with the Poverty Point period (Weinstein 1978:A/23-A/25;

Thomas 1982:3). The other Poverty Point site in the area is 16OR34, the Garcia site. Recovery of microflints at the Shell Beach site (16SB44), suggests the possibility of an occupation dating to this period (Wiseman et al. 1979:6-9 and Figure 6-4). The locations of 16OR40 and 16SB44 relative to the developing St. Bernard Delta complex are shown in Figure 9.

#### The Tchula Period

Tchula period occupations in the Lower Mississippi Valley are associated with the Tchefuncte culture. The period has been called “the early ceramic period” because, with the exception of

Period	Culture	Date	Phases		
			Eastern Coast	Central Coast	Western Coast
Historic	Various Historic Tribes	A.D. 1800		Various Historic Tribes	
Protohistoric		A.D. 1600	Delta Natchezan	Petit Anse	
Mississippi	Mississippian Plaquemine	A.D. 1400	Barataria	Bayou Petre	Bayou Chene
		A.D. 1200	St. Gabriel	Three Bayou	Holly Beach
	Coles Creek	A.D. 1000	Bayou Ramos	Morgan	Jeff Davis
		A.D. 800	Bayou Cutler	White Lake	Welch
Baytown	“Coastal Troyville”	A.D. 600	Des Allemands	?	Roanoke
		A.D. 400	Grand Bayou		
Marksville	Issaquena-like	A.D. 200	Magnolia	Veazey	Lake Arthur
	Marksville	0	Labranche		
Tchula	Tchefuncte	200 B.C.	Beau Mire	Jefferson Island	Lacasine
		400 B.C.	Pontchartrain		
		600 B.C.	Garcia	Beau Rivage	?
		800 B.C.			
		1000 B.C.			
		1200 B.C.	Bayou Jasmine	Rabbit Island	
		1400 B.C.			

Table 1. Culture Chronology of the Coastal Zone.

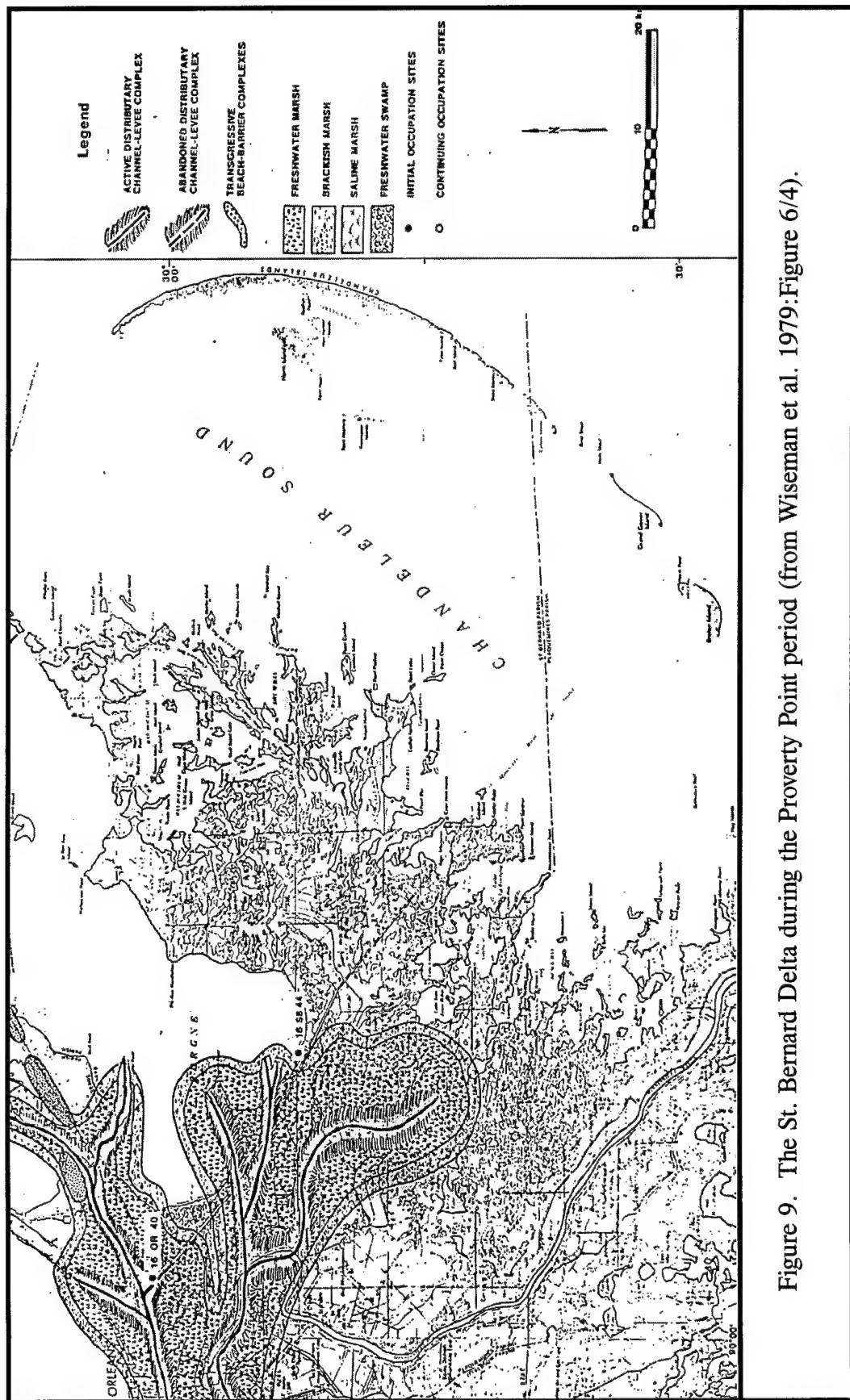


Figure 9. The St. Bernard Delta during the Poverty Point period (from Wiseman et al. 1979:Figure 6/4).

fiber-tempered pottery, it was the interval during which initial pottery complexes appeared in the Lower Mississippi Valley. Sites are few and scattered, and there are no universal markers. However, within subareas such as South Louisiana, regional markers, primarily Tchefuncte type ceramics, have been identified (Phillips 1970:7, 8, 15, 76).

Peoples of the Tchefuncte culture were the first in the region to engage extensively in the manufacture of ceramics. Fiber-tempered and some grog-tempered or temperless sherds have been recovered from earlier Poverty Point contexts. However, these may represent primarily trade goods from the earliest pottery-making cultures to the east. The basic Tchefuncte ware is temperless or grog-tempered, with accidental inclusions of small quantities of sand and vegetable fiber. Sand-tempered wares represent a minority constituent of Tchefuncte site assemblages (Shenkel 1984:47-48).

The Tchula period was one of extensive progradation of the St. Bernard Delta Complex. A number of Tchula period sites associated with that complex have been recorded in Orleans Parish. These include Big Oak Island (16OR6) and Little Oak Island (16OR7). However, Wiseman et al. (1979:Table 4-2) list only one site (16SB44, Shell Beach) in St. Bernard Parish with ceramics indicative of a Tchula period occupation. Its location relative to the developing delta complex is shown in Figure 10. Wiseman et al. (1979:6-15) indicate that Tchula period sites associated with the St. Bernard Complex were located on major beach ridges or on older, more stable portions of the delta. They suggest that "These areas may have been the most attractive for semi-permanent villages as opposed to temporary fishing or waterfowl hunting camps" (Wiseman et al. 1979:6-15).

Wiseman et al. (1979:6-13) propose two possible explanations for the small number of sites representing this period. The paucity of sites "...may reflect the unstable condition of the rapidly developing delta lobe and its unsuitability for settlement" (Wiseman et al. 1979:6-13). The alternative explanation proposed by Wiseman et al. (1979:6-13) to explain the apparent dearth of sites is "our incomplete archeological record of the area." The incompleteness of that record may be the result of the loss of sites due to subsidence and erosion, or it may simply reflect the fact that excavations have not been conducted to the bases of intact middens where Tchula ceramics may lie buried (Wiseman et al. 1979:6-13).

### **The Marksville Period**

The Marksville period is associated with a Hopewellian culture and tradition manifested throughout the Lower Mississippi Valley (Phillips 1970:7, 17-18, 886). The Hopewell culture's two major centers of development were in Ohio and Illinois, and date to between 200 B.C. and A.D. 400. Diffusion of aspects of the culture may have resulted from the activity of traders who established a wide-ranging network, sometimes termed the "Hopewellian Interaction Sphere."

In addition to diagnostic pottery types of the Marksville period, conical burial mounds were characteristic of the culture. Interments are generally associated with grave goods. Some of these were manufactured from exotic raw materials (Neuman 1984:142-168).

Only one site (16SB23) dated to the early portion (Labranche phase [A.D. 1 - A.D. 200]) of the Marksville period has been reported in St. Bernard Parish (Wiseman et al. 1979:4-14; Weinstein and Kelley 1992:Figure 3-4). Its location at the distal end of a delta lobe is shown in Figure 10. Early Marksville sites are more numerous in that portion of the delta that would later become Orleans Parish (Figure 10). Sites in this area include 16OR1, 16OR2, 16OR3, 16OR4, 16OR5, 16OR6, 16OR7 and 16OR16. All were occupied initially during the Tchula period (Wiseman et al. 1979:4-17).

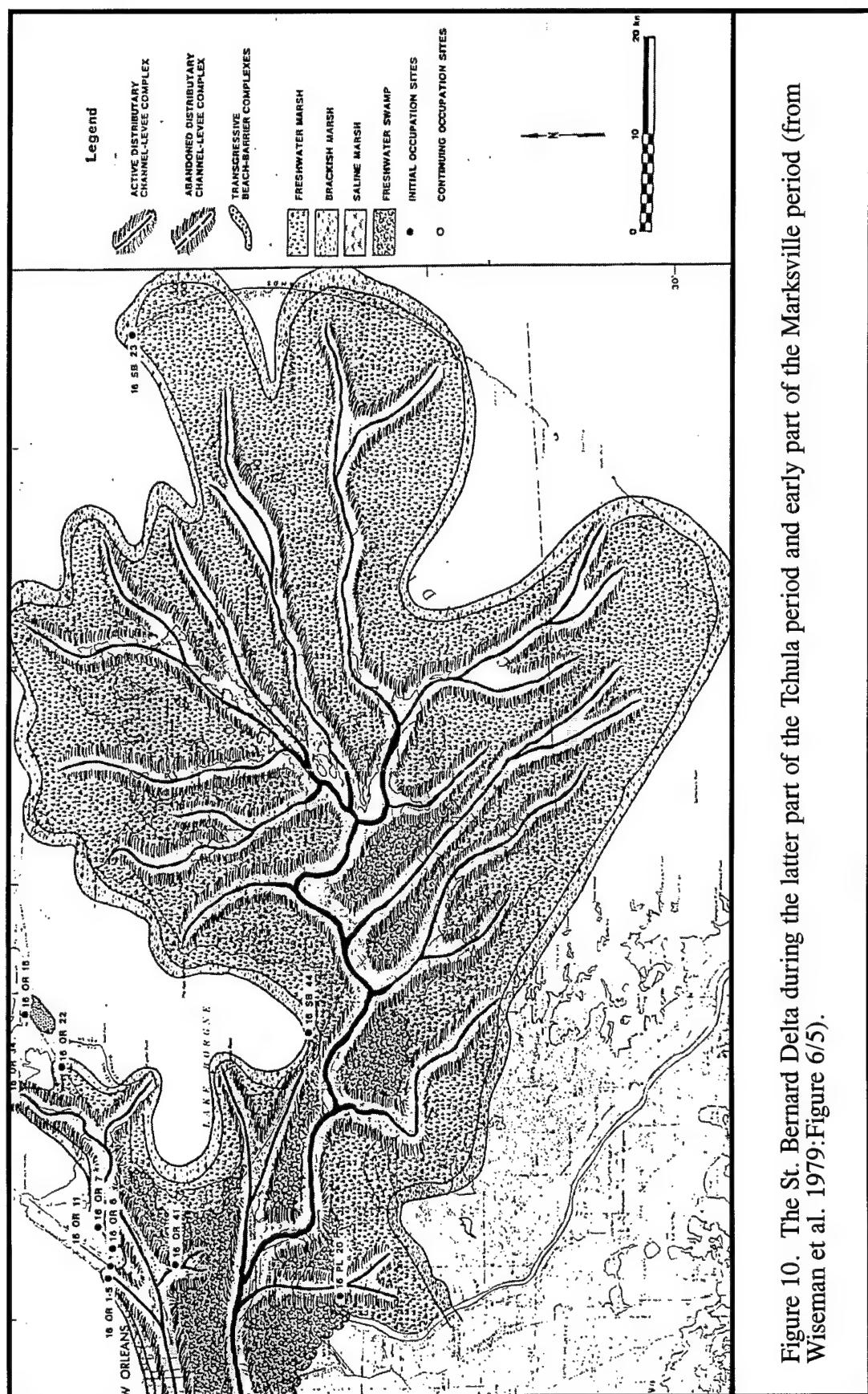


Figure 10. The St. Bernard Delta during the latter part of the Tchula period and early part of the Marksburg period (from Wiseman et al. 1979:Figure 6/5).

Sites dated by Wiseman et al. (1979) to the latter part of the Marksville period (Magnolia phase, A.D. 200 - 400) become far more numerous in the developing St. Bernard Delta. Their locations are shown in Figure 11. They include the Magnolia Mound site (16SB49), which, with its several mounds, is one of the largest sites in St. Bernard Parish.

Wiseman et al. (1979:6-17) note that many of the Late Marksville sites "...were located in the vast central portion of the delta which seems to have been previously avoided." The well-developed natural levees associated with channels whose flow was now greatly diminished appear to have offered "...the best prospects for expanding settlement" (Wiseman et al. 1979:6-17). The number of newly occupied sites, in conjunction with the presence of earlier sites that continued to be used, suggests to Wiseman et al. (1979:6-17) both an increase and a shift in population.

### **The Baytown Period**

The Baytown period has been defined rather simply as the interval between the end of Marksville culture and the emergence of Coles Creek culture. At the time of Phillips' (1970) synthesis, no area-wide horizon or period markers were known for the southern half of the Lower Mississippi Valley (Phillips 1970:901).

The Baytown period is often referred to as the "Troyville period" by Delta archeologists. Because of the lack of diagnostic markers and the paucity of excavated sites representing the period in southeastern Louisiana, it is often assimilated with the subsequent Coles Creek period, and the two are together referred to and discussed as "Troyville/Coles Creek cultures" (e.g. Neuman 1984).

Wiseman et al. (1979:4-4) considered varieties of Hollyknowe Ridge Pinched, Larto Red, French Fork Incised, Pontchartrain Check Stamped, Woodville Zoned Red, and Coles Creek Incised to be diagnostic ceramics associated with the Baytown period. They assign ten sites in St. Bernard Parish and two in Orleans Parish to the period (Figure 12).

Wiseman et al. (1979) note that at the time of their synthesis of prehistoric occupations in St. Bernard Parish, it remained difficult to identify Baytown sites on the basis of available ceramic assemblages. For this reason, they suggested that many Coles Creek sites may have been occupied during the Baytown period (Wiseman et al. 1979:6-21). It appears that this suggestion may also be based on the notion that population size was steadily increasing from the Marksville through the Coles Creek periods (Wiseman et al. 1979:6/16-6/23).

### **The Coles Creek Period**

The Coles Creek period is the interval that begins with the emergence of Coles Creek culture in the southern part of the Lower Mississippi Valley and ends with the establishment of "full-blown" Mississippian culture in the northern part of the Valley (Phillips 1970:18). Coles Creek culture was characterized by small ceremonial centers with mounds. These were surrounded by villages of varying size. The culture developed in the area between the mouth of the Red River and the southern part of the Yazoo Basin. Its influence filtered into the delta region of southeastern Louisiana (Brown 1984:95).

Mounds associated with the Coles Creek culture generally are larger and exhibit more construction stages than those associated with the earlier Marksville culture. A more significant difference is that Coles Creek mounds are pyramidal and flat-topped, and they were used as substructures for religious and/or civic buildings. In contrast, Marksville peoples generally built conical burial mounds (Neuman 1984:167).

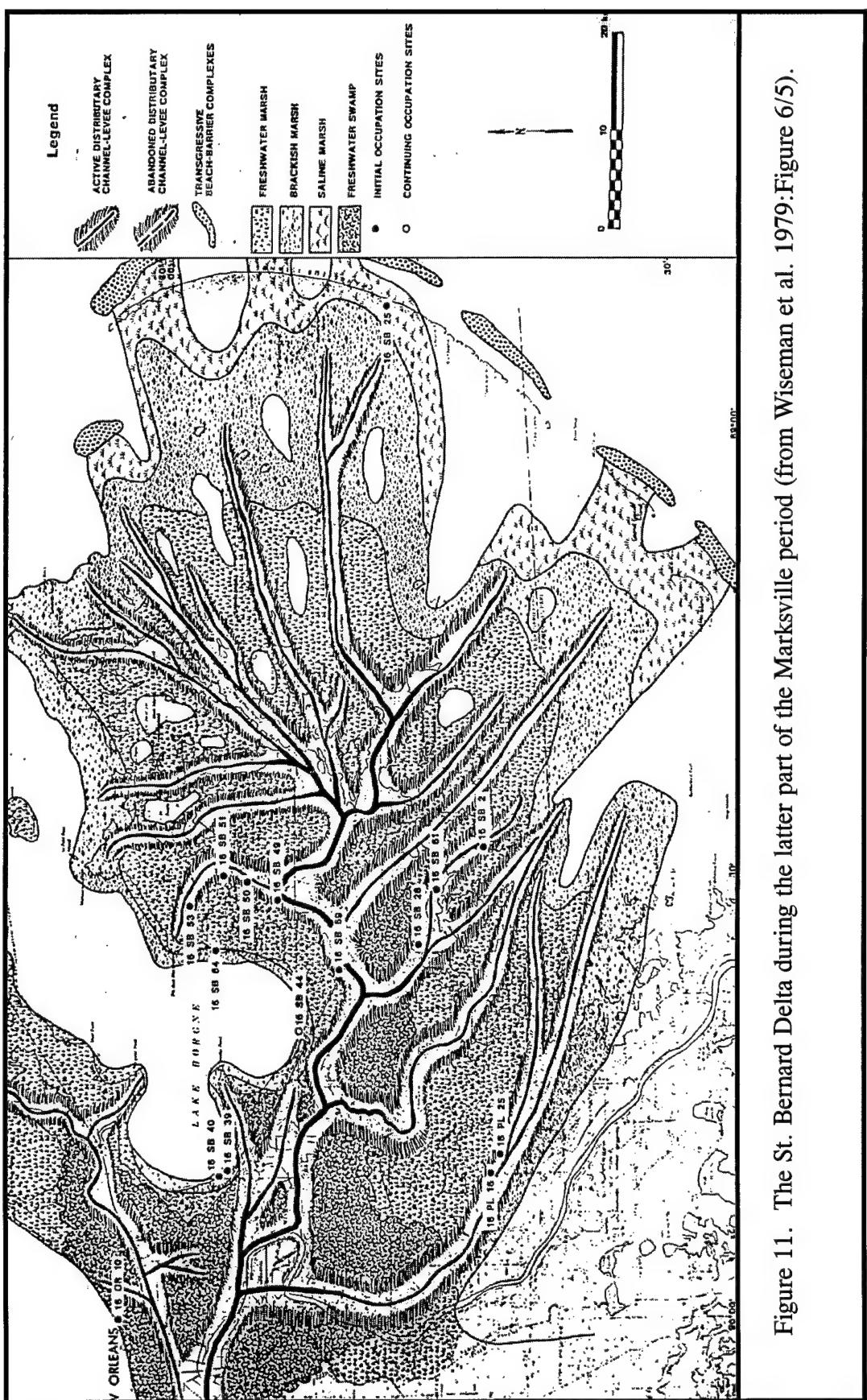


Figure 11. The St. Bernard Delta during the latter part of the Marksville period (from Wiseman et al. 1979:Figure 6/5).

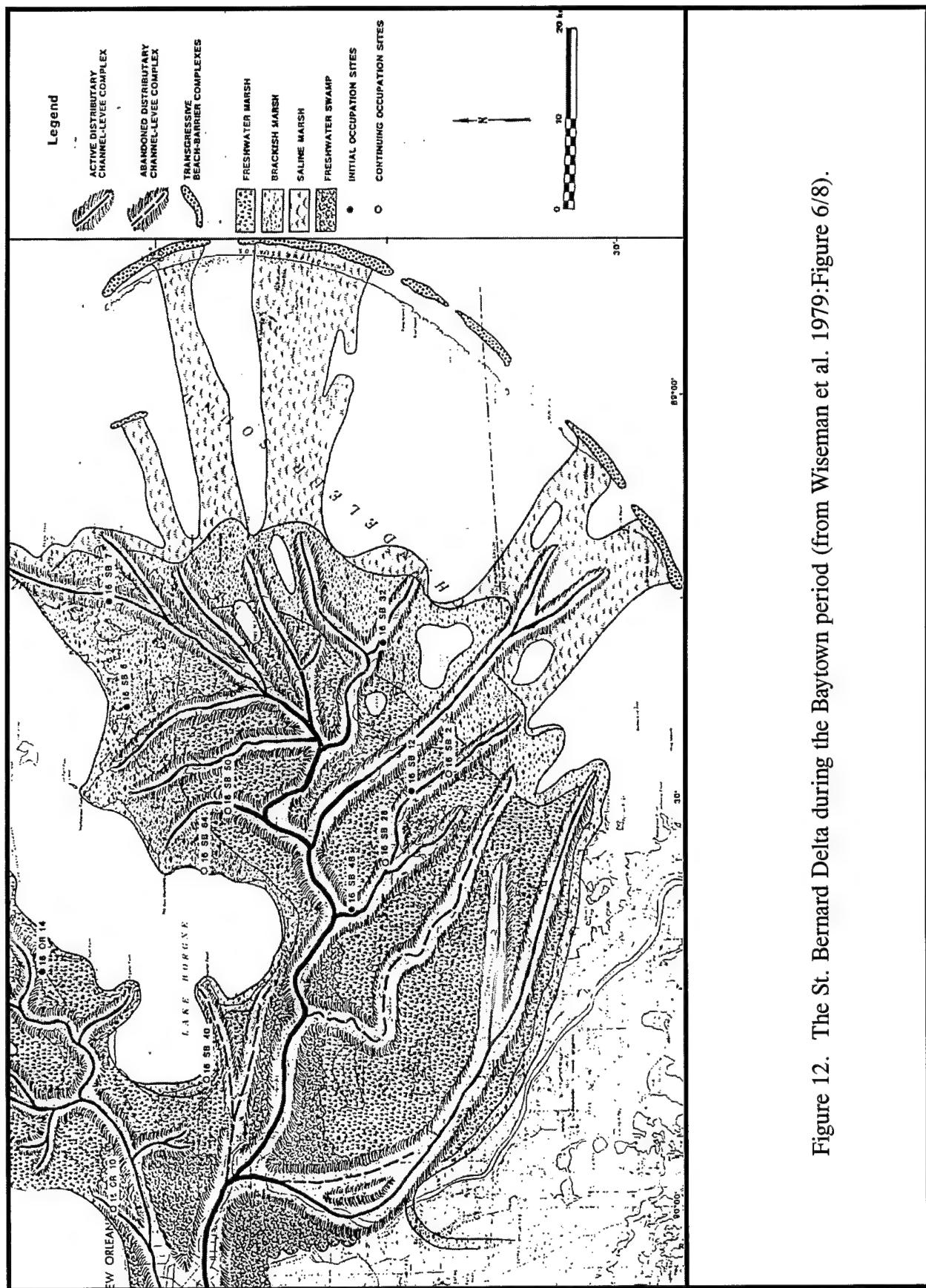


Figure 12. The St. Bernard Delta during the Baytown period (from Wiseman et al. 1979:Figure 6/8).

Relatively large numbers of Coles Creek period sites have been reported within the St. Bernard Delta Complex (Wiseman et al. 1979:Figure 6-9). The locations of the sites in relation to the delta, which was now deteriorating, are shown in Figure 13. Comparison of this figure with Figures 10-12 shows that the number of sites representing the Coles Creek period is more than twice that of either the Marksville or Baytown periods.

Wiseman et al. (1979:6/23) indicate that by the Coles Creek period, the extent of freshwater marsh and swamp had been considerably reduced in the northern part of the St. Bernard Delta. These same ecozones were increased in the southern part of the delta. The change was related to changes in the flow of the Mississippi River and its distributaries. Wiseman et al. (1979:6/23) further note that although there are many Coles Creek sites in the northern part of the delta, they appear to be small. In contrast, 16PL14 (Bayou Terre aux Boeufs) is a multi-mound site in the southern part of the delta, and may represent a focus of settlement during this period.

### The Mississippi Period

The beginning of the Mississippi period is marked by the emergence of Mississippian culture in the northern part of the Lower Mississippi Valley and Plaquemine culture in the southern part (Phillips 1970:18-19). The Plaquemine culture itself is sometimes considered to be the classic development of temple mound construction in the lower portion of the Lower Mississippi Valley. However, archeological excavations suggest that it actually represents a late prehistoric development of the preceding Coles Creek culture. Multi-mound construction and artifact assemblages are evidence that link the two. Absence of European trade goods indicates that the Plaquemine culture reached its zenith prior to contact (Neuman 1984:258-259).

Sites dated to the period of contact represent a Delta-Natchezan phase [A.D. 1500 - A.D. 1700] (Weinstein and Kelley 1992:Figure 3-4). Proportions of ceramic types change, some new styles and types appear, and European trade goods are often found in association with the aboriginal materials (Quimby 1957:118-119, 134-144).

During the Mississippi period, the St. Bernard Delta complex continued to shrink because of reduced flow of water. Environmental changes would have included a reduction in the area covered by freshwater swamp and an increase in the area covered by brackish and saline marsh (Wiseman et al. 1979:6-27). Figure 14 depicts locations of pre-Contact Mississippi period sites within the shrinking St. Bernard Delta. The number of sites is somewhat reduced relative to that of the preceding Coles Creek period but it is still greater than that of earlier periods.

Wiseman et al. (1979:6-27) indicate that most of the sites which yield Mississippi period ceramics were initially occupied during one of the earlier periods. Few new sites were established in the St. Bernard Delta. To those authors,

...Many of the sites still suggest hunting and gathering camps, and probably represent only half of a subsistence pattern. The other half of the pattern is reflected in agricultural villages located on the most inland parts of the eastern delta, or even further up the alluvial valley as was suggested for the previous Coles Creek period [Wiseman et al. 1979:6-27].

However, Wiseman et al. (1979:6-27) recognize that little is known about the extent and nature of agriculture in southeastern Louisiana during prehistoric times. In fact,

...the eastern delta sites may have been occupied by hunters and gatherers who practiced no, or only small-scale, farming throughout the prehistoric period and who retired seasonally to other hunting and gathering locales further inland or on the coast [Wiseman et al. 1979:6-29].

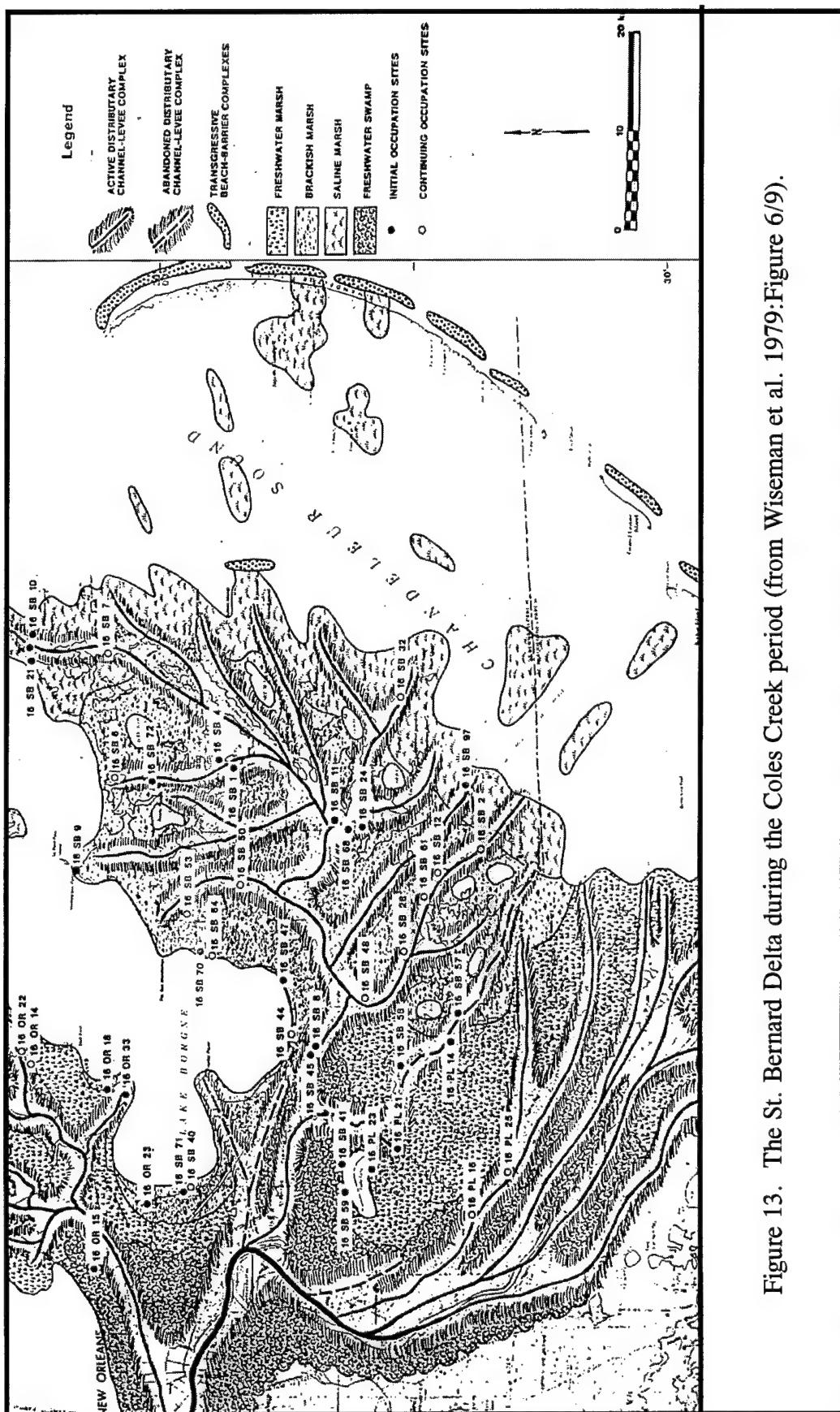


Figure 13. The St. Bernard Delta during the Coles Creek period (from Wiseman et al. 1979:Figure 6/9).

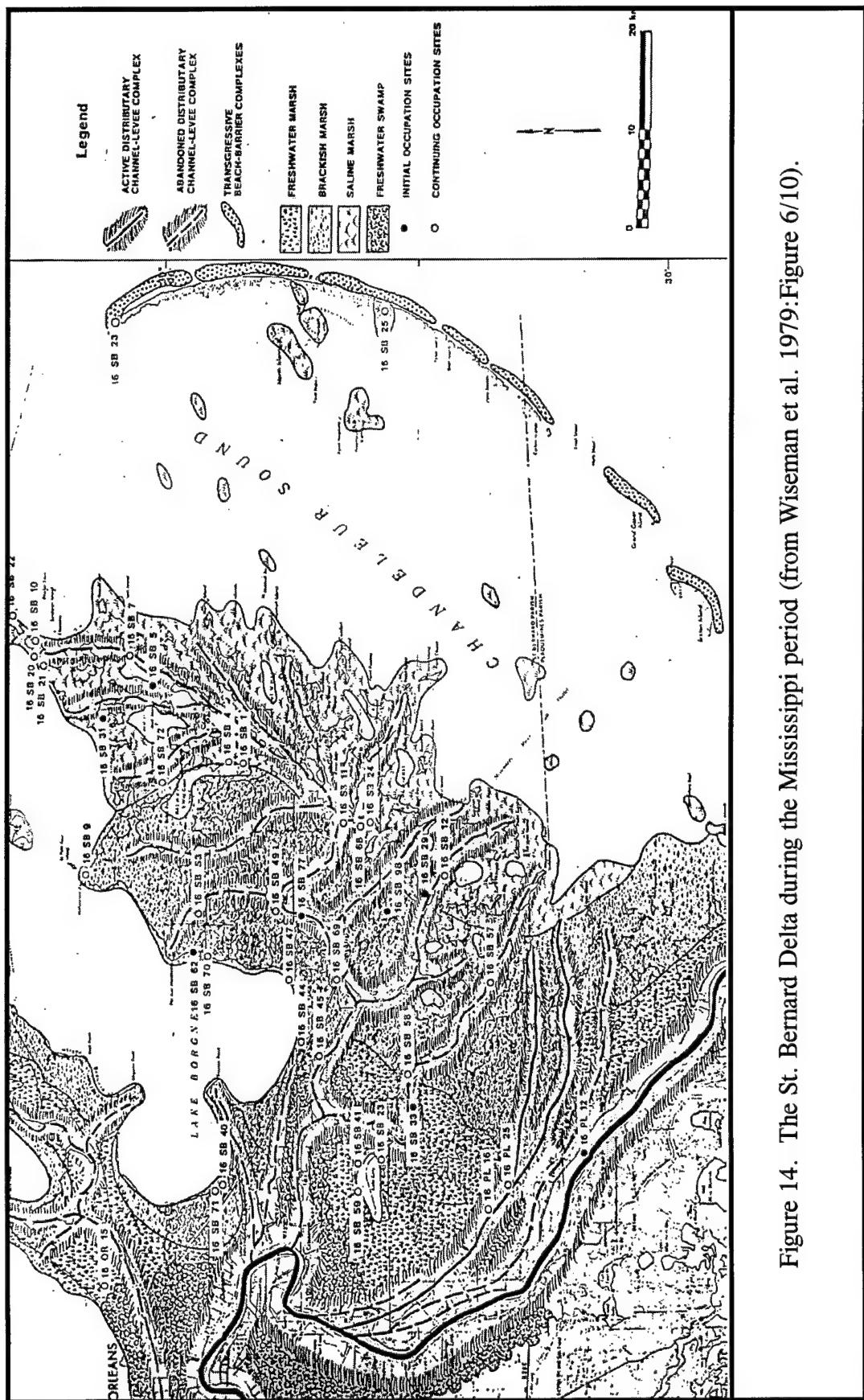


Figure 14. The St. Bernard Delta during the Mississippi period (from Wiseman et al. 1979:Figure 6/10).

## The Paleogeographic Interpretation of Sites in the St. Bernard Delta

Wiseman et al. (1979) interpreted site density and site location in terms of paleogeographic changes, which were the result of changes in the pattern of flow of the Mississippi River (see also Chapter 2 of this report). To some extent, subsidence and deposition are important variables because they create conditions such that only fortuitous events such as dredging will reveal the location of many sites (Wiseman et al. 1979:6/30-6/31).

Nevertheless, it appears that sites were initially occupied as an area entered the deterioration phase of the delta sequence. Such locations may have offered four advantages:

- a) natural levees were still sufficiently elevated above the marsh to provide suitable habitation spots; b) water flow and consequently the violence of flooding was reduced; c) biological productivity was at a maximum; and d) a diversity of habitats existed including lake edge, bayou, marsh and natural levee [Wiseman et al. 1979:6/31].

Wiseman et al. (1979:6-31) also propose a model to explain site location in terms of "convenience, comfort, and gain." Those three factors refer to the notion that a site should be convenient in terms of location, a site should be relatively comfortable in terms of environment, and/or occupation of the site should offer some benefit such as access to a critical resource. Within the St. Bernard Delta, the hypothesis proposed by Wiseman et al. (1979:6-31), and which they state is highly speculative, is

a settlement pattern involving utilization of inland hunting sites in winter, coastal hunting sites in spring and early summer, and agricultural activities (by Mississippi period times, at least) the rest of the year... [Wiseman et al. 1979:6/31].

New World Research, Inc. (1983) concurred with Wiseman et al. (1979) that site location and site density are linked with environmental factors. However, they assert that cultural factors are also important and that these factors have generally, with the exception of Shenkel (1974), been neglected by archeologists in southeastern Louisiana (New World Research, Inc. 1983:41).

## CHAPTER 4 HISTORIC OVERVIEW

The project area is located in St. Bernard Parish, inland from the southern shore of Lake Borgne and adjacent to the Mississippi River Gulf Outlet Canal at its junction with Bayou La Loutre. *Loutre* is the French word for otter. Native Americans were not residing in the vicinity of the southern side of Lake Borgne with any regularity in the early historic period, and French explorers seemed more interested in proceeding directly to Lake Pontchartrain rather than examining the shore of Lake Borgne. The vast expanses of sea marsh on the eastern side of modern St. Bernard Parish were unattractive to large numbers of early settlers. Thus, the future Parish was settled from the interior first, that is, from the Mississippi River side. A number of land grants were made along the Mississippi River in future St. Bernard Parish as early as 1721, when the Company of the Indies granted a tract in the vicinity of later Arabi to Sieur Leblanc. Among the most notable early planters holding tracts in the future St. Bernard area was Pierre Rigaud, Marquis de Vaudreuil, who was the governor of Louisiana from 1741 to 1753. Other concessionaires in the area included Toutant Beauregard, Adolphus Ducros, DeClouet, Delaronde, Villeré, Bernard de Marigny, De Fazende, and Antonio Phillipon (WPA of LA 1940:499; Raby 1980:64).

The inhabitants of the Mississippi River concessions probably began to use a route between the Mississippi River and Bayou La Loutre when heading toward or coming from the east, and others likely used it as one alternative to the Bayou St. John-Lake Pontchartrain water route to and from New Orleans. Leaving the Mississippi approximately opposite Fort de Mississippi (Fort de la Boulaye), the traveler could take one of three routes to the east. One of these routes joined Bayou Terre Aux Boeufs near Delacroix, thence to the vicinity of Reggio, where possibly a short portage led either to upper Shell Beach Bayou or Bayou La Loutre (Figure 15). In the eighteenth century Bayou La Loutre (sometimes referred to as Bayou L'Outre or Bayou Loutre) may have connected with Bayou Terre aux Boeufs near modern Alluvial City and Yscloskey. Traveling east on Bayou La Loutre, probably another portage brought one to Bayou St. Malo and then Lake

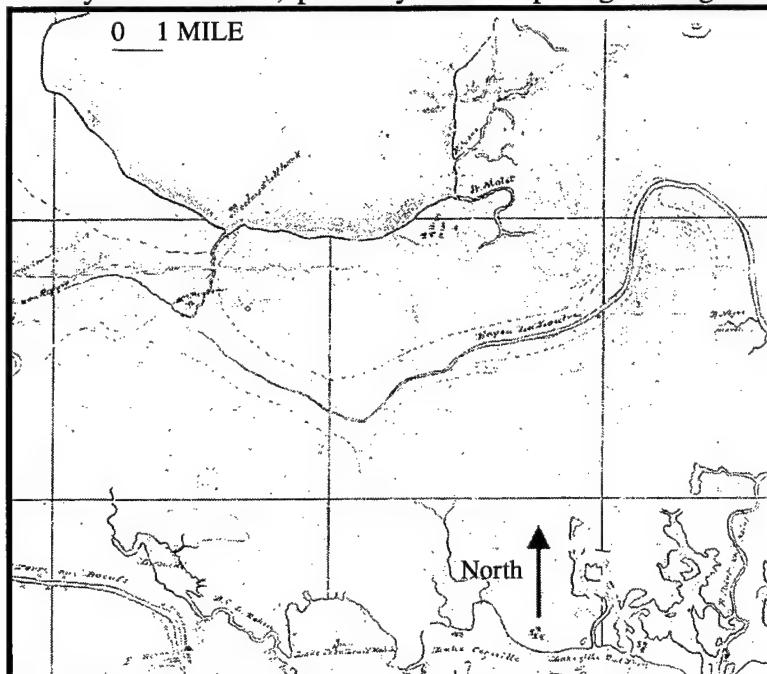


Figure 15. Excerpt from Powell (1846) showing Bayou La Loutre; natural levee is probably indicated by dashed lines (Louisiana Collection, Howard-Tilton Memorial Library, Tulane University).

Borgne. Alternatively, the traveler could remain on Bayou La Loutre and enter Chandeleur Sound from Eloi Bay (Pearson et al. 1989:88). It is not clear how popular these routes to and from the Mississippi were, but if portaging was necessary it probably meant that only pirogues and small bateaux could be used. However, it is also possible that these waterways were connected depending upon wind, tide, and Mississippi River level. Boat travel on Bayou La Loutre probably declined during the nineteenth century, and much of the channel was filled with silt by the early-twentieth century (St. Bernard Parish 1907:26).

During the French colonial period, what would later become St. Bernard Parish was under the direct supervision of the Superior Council in New Orleans. The area did not become a civil entity separate from New Orleans until 1780, during the

Spanish regime (Smith 1989:46; Hyland 1980:6). Many of the French concessionaires had their grants reaffirmed under the Spanish, and in 1778, Marigny de Mandeville received a large tract along Bayou Terre Aux Boeufs (WPA of LA 1940:499).

The Spanish were interested in bolstering the Catholic and agrarian population of their Louisiana colony, and the grant to Marigny de Mandeville did not prevent the Spanish from settling a number of Canary Islanders, or *Isleños*, along Bayou Terre Aux Boeufs in 1779. The *Isleño* colonists were mostly families impoverished by the economic stagnation on the Canary Islands. The family heads were recruited as soldiers, but upon arrival in Louisiana the plans to maintain a regiment were abandoned. Spain's settlement policy with the *Isleños* was relatively generous, as it was with other groups, such as Spaniards from Malaga and Grenada in 1778-1779, and Acadian settlers in the 1760s and 1780s. Governor Bernardo de Gálvez received large tracts of land granted by the Spanish crown to distribute to the settlers in various parts of the colony. Terre Aux Boeufs (or *Tierra de Bueyes*) was supposedly named for the prevalence of oxen among these early *Isleño* settlers, and in fact, the *Tenerfeños*, or natives of Tenerife, preferred oxen to horses as draft animals. However, other ascriptions of the name state that the bayou was one of the last haunts of bison in the region.

The St. Bernard District was officially organized under the name of *La Concepción* on February 17, 1780. Pedro Marigny (Pierre de Marigny de Mandeville), who had donated some of his own vacant land for the *Isleño* settlement, was appointed first commandant. Of the four *Isleño* settlements, *La Concepción* was the only one that was a long-term success, since the others were poorly situated for inhabitation or farming. Many of the *Isleños* from the other settlements eventually moved to Terre Aux Boeufs. A few Acadians were located at Terre Aux Boeufs in 1786 by the Spanish administration, and these traditional and Catholic people assimilated easily with the *Isleños* (Raby 1980:65; Din 1988:51-53; Yakubik *et al.* 1996).

A church and parsonage was constructed at St. Bernard on Terre Aux Boeufs in 1785. The *La Concepción* district was eventually referred to by the name of the Parish church, that of San Bernardo, who had been selected as *patron* of the Parish in honor of Governor Bernardo de Gálvez. The original St. Bernard church burned in 1917 (WPA of LA 1940:500; Raby 1980:65; Din 1988:51-53).

Another planter to receive a Spanish grant was Thomas Proctor, who came to Louisiana after retiring from the U.S. Army in 1789. Proctor's tract was centered at modern Yscloskey, and the promontory jutting out from the south side of Lake Borgne, northwest of Yscloskey, was named Proctor's (or Proctor) Point. East of Proctor's tract was the area known as *La Chinche* ("bedbug"), which extended about 12 miles east of modern Yscloskey. The origin of the name of Yscloskey is obscure, and has been ascribed to either a corruption of a Native American place-name or to a nineteenth-century landowner in the vicinity (WPA of LA 1940:502).

During much of the eighteenth century, the economy of the St. Bernard was dominated by the commercial agriculture of the Mississippi River plantations, where indigo was the main crop. Indigo, however, was capital- and labor-intensive, requiring a slave workforce. The Louisiana indigo industry declined in the 1790s from a variety of causes. Most St. Bernard planters who were able to do so converted to sugarcane cultivation. St. Bernard planters Antonio Mendéz (Royal Procurator of Louisiana), his partner Manuel Solis (originally from Santo Domingo), and a hired sugar maker from Cuba named Morin successfully granulated sugar about 1791, apparently the first planters in colonial Louisiana to do so. Mendéz and Solis sold Etienne De Bore his first cane in 1794. De Bore's plantation was located six miles above New Orleans, and he became the first planter to grow cane and process it into sugar successfully on a large commercial scale (Raby 1980:83; Hyland 1980:6). Sugar became the prevalent crop on the river reaches of the Parish. In the interior, the inhabitants along Bayou Terre Aux Boeufs pursued mixed agriculture on smaller farms, and others trapped muskrat and otter in the marshes or became more or less full-time fishermen in the teeming coastal waters.

A number of plantations in the area also produced commercial quantities of cypress lumber. Cypress was much in demand in New Orleans and in the Caribbean colonies. Numerous planters in the St. Bernard area had canals dug on their plantations to float logs from the *cyprières* on their back lands and to provide millraces for sawmills (Smith 1989:50). The Louisiana lumber export business went into decline during the American Revolutionary War due to the loss of markets (Moore 1983:43). However, it revived in the 1790s, when the Spanish crown granted Louisiana a monopoly on the manufacture of sugar boxes for Spanish sugar-producing colonies (Smith 1989:50).

The wetland zone on both sides of Bayou La Loutre natural levee originally consisted largely of marsh, brackish to the north, and probably only a narrow band of suitable environment on the margin of the natural levee could have supported any cypress timber within the historic period. In 1819, James L. Cathcart, under commission from the U.S. Navy, explored southern Louisiana for timber suitable for naval construction. At Lake Borgne, Cathcart described the timber as "of such a quality, so dispers'd & so small in quantity, as it is unworthy attention" (quoted in Prichard et al. 1945:883). The relatively small natural levee of Bayou La Loutre, from the Hopedale vicinity west, was probably dominated by hardwoods such as oak, ash, and hickory, plus less valuable species such as cottonwood and willow (Trahan et al. 1989). The presence of hardwood trees along Bayou La Loutre would have indicated to the early inhabitants that the soil and elevation were suitable for agriculture, and *Isleño* settlers and others probably soon pushed east from Bayou Terre Aux Boeufs. The total population of the San Bernardo district in the late 1780s was only about 700 persons.

Among the colorful aspects of St. Bernard Parish history, but one that has been little documented, is the *cimarróne* settlements that grew up in the vicinity of Lake Borgne during the Spanish colonial period. The *cimarrónes* (literally, "strays") were runaway slaves, called *marons* or *nègres marons* in French, and "maroons" in English. By the 1780s, *cimarróne* bands had established themselves in several isolated areas of Louisiana, including the Lake Borgne vicinity. Relying on forests, backswamps, and marshes to avoid apprehension, the *cimarrónes* in some cases built permanent settlements and engaged in agriculture as well as hunting and fishing for their sustenance. In some documented instances, the *cimarrónes* participated in illicit lumbering in the *cyprières*, supplying white sawmill owners with logs that had been cut and squared (Hall 1992:207; Porteous 1937:840-865). The geographic centers of the *cimarróne* bands were the Bas de Fleuve, an area of the Mississippi River below New Orleans, and Lake Borgne. As mentioned above, several small waterways connected the River and the Lake, allowing relatively inconspicuous access. The *cimarrónes* of lower Louisiana had a charismatic leader named St. Malò, a runaway from the Darenbourg estate on the German Coast. St. Malò accumulated a significant following and established a number of settlements, including Ville Gaillarde on Lake Borgne and another at Chef Menteur (Hall 1992:214). While the precise locations of these settlements are not known, Bayou St. Malò and Bayou Nègre Maron near the project study area are associated with the *cimarrónes* and their leader. Access to the *cimarróne* communities by land was considered nearly impossible, and they were approachable from Lake Borgne only by small bayous. Some *cimarrónes* apparently grew corn on the Terre Aux Boeufs ridge (Hall 1992:212), but this may actually have been Bayou La Loutre, since the two were sometimes confused.

By 1782, the slaveowners of lower Louisiana felt the situation with the St. Malò band was intolerable and pressured the Spanish administration to act. Two unsuccessful expeditions against the Ville Gaillarde settlement were undertaken by the Spanish authorities. In another expedition in March 1783, Don Guido Dufossat broke up the settlement at Ville Gaillarde, killing three maroons and capturing 32 others. St. Malò and ten others escaped, and eventually reassembled at Ville Gaillarde. Lieutenant Francisco Bouigny then made another attack on Ville Gaillarde, and St. Malò was captured along with 16 other *cimarrónes*. By this time, the number of runaway slaves imprisoned in New Orleans reached a total of 60 persons of both sexes. Some of the slaves

were charged with robberies and other felonies and after trial and condemnation, were hanged along with St. Malò. Others were flogged with up to several hundred strokes and sent back to their masters (Porteous 1937:861-862).

The Spanish regime succeeded in suppressing the larger bands of *cimarrónes*, but at the end of the eighteenth century, smaller groups of runaway slaves were still at large. In 1799, the planters of the upper portion of the San Bernardo district complained to the Governor that *cimarrónes*, still operating from settlements on Lake Borgne, were stealing their goods and livestock. Rewards of four pesos were offered for any fugitive slave apprehended in New Orleans, seven pesos for a slave captured in the cypress swamps, and ten pesos for a slave captured on the lakes or islands. However, these efforts to capture the *cimarrónes* were apparently unsuccessful (Din 1988:59-60). As the area became more heavily settled and traveled over time, the *cimarrónes* bands seem to have vanished.

At the end of the colonial period, approximately 800 persons resided in St. Bernard Parish. The inhabitants grew sugar, cotton, and still some indigo on the large plantations, and produced corn, beans, poultry and eggs, butter, hogs, and assorted vegetables on the smaller farms. The initial reaction of some American observers to the inhabitants of the Terre Aux Boeufs was not uniformly favorable. Dr. John Watkins, sent by first American Governor Claiborne to visit the settlements, described the residents as poor and humble, but also as indolent and ignorant, and as people who "idolize their priests, and feel little attachment for anyone else" (quoted in Din 1988:60).

Fishing was an occupation of some St. Bernard inhabitants, and a village of "Spanish fishermen" was located on the southern shore of Lake Borgne at Bayou Bienvenue in the early nineteenth century (Latour 1816:84). After the completion of canals on the Villere, Lacoste, Ducros, Delaronde, and Phillipon plantations linking Lake Borgne with the east bank of the Mississippi, fishermen used the canals to bring their catch in pirogues from the lake to the heads of the canals. The catch was then loaded into wagons and carried to market in New Orleans (Wicker et al. 1982:72).

Lake Borgne and St. Bernard Parish were the locales of the most important events of the British campaign in Louisiana during the winter of 1814-1815, culminating in the Battle of New Orleans. On December 13, 1814, the American position received a severe blow with the loss of control of Lake Borgne to the British. Subsequently, a British officer bribed three of the "Spanish fisherman" from the shore of Lake Borgne to show him a route from the lake to the Mississippi. They obligingly showed him Bayou Bienvenue and the Villere plantation canal. General Jackson sent a picket force to guard Bayou Bienvenue, but the British surprised and captured the pickets to a man on December 22nd. Before noon the next day, a substantial British force had reached the Villere plantation house, as Jackson was astonished to learn. However, the British were ultimately unable to progress from this threatening stroke to a *coup de grace* despite the prodigious logistical feat of moving men and material rapidly from lake Borgne to the Villere plantation (Casey 1963:44-45). The tactical calculations of British General Pakenham proved faulty; by the time the British began a final advance against the Americans at Chalmette on January 8th, Jackson's motley force of regular troops and volunteers were in prepared positions. The British assaults were easily repulsed by the Americans, and the British were forced to make a strategic withdrawal after heavy losses. The American victory at Chalmette, although achieved after the Treaty of Ghent had been signed, ended the War of 1812 on a note of triumph for the United States and cemented the peace terms.

The British presence in St. Bernard during the campaign was disruptive beyond the battlefield. The British sent a contingent of their Black West Indian troops to the Phillipon Plantation, and scores of slaves from surrounding plantations fled to the British forces during the weeks of the campaign. At the conclusion of operations, the British refused to turn over almost two hundred of

the refugee slaves to the Americans, insisting that the refugees be treated as deserters from the Americans. British troops appropriated livestock from the plantations they occupied, and when these supplies were exhausted they went farther afield. Farms at Terre Aux Boeufs and English Turn suffered from British foraging parties. Arsène Latour estimated the value to local plantations of losses in slaves, cattle, horses, buildings, and appurtenances at \$200,000 (Smith 1989:50). Several fortified works were constructed at strategic points in St. Bernard Parish by the U.S. Army after 1815 to protect water routes from Lake Borgne to the Mississippi River in case of another threat to New Orleans (Jones et al. 1993:41-63).

During the antebellum period, St. Bernard Parish retained its characteristic mix of commercial agriculture, with sugar plantations concentrated on the Mississippi River reaches of the parish and livestock and truck farms in the lower portion of the parish. Population grew from 1,020 persons in 1810 to only 4,076 persons in 1860, making St. Bernard the least populous parish in the state on the eve of the Civil War. The population was heavily concentrated along the river. The sugar plantations with their large slave forces contributed to the parish population, which was more than 50 percent African-American in 1860 (Goins and Caldwell 1995). Arabi (not named until after the Civil War) developed as a suburb of New Orleans from about 1850 on. The lower portion of the parish was much less densely populated; except for Terre Aux Boeufs and upper Bayou La Loutre, much of the Parish was marsh, wet prairie, or swamp, and settlement was sparse or totally absent. An exception to the agrarian basis of the antebellum St. Bernard economy was the Shell Beach resort on the southern shore of Lake Borgne east of Proctor Point. By 1856, a hotel and 1200-foot pier had been constructed, served from New Orleans by a branch line of the Mexican Gulf Rail Road.

St. Bernard Parish saw relatively little military activity during the Civil War, except for a flurry during the New Orleans campaign of 1862. During the first year of the Civil War, the Louisiana government constructed a battery facing the Mississippi River at Chalmette, the earthworks roughly paralleling the lower edge of the modern National Cemetery. As the winter of 1862 ended, Louisiana was depleted of troops to augment the Confederate army in Tennessee. In mid-March, martial law was declared in Orleans, Jefferson, St. Bernard, and Plaquemines parishes to force conscription registration. The Chalmette battery received ten 32-pounder and two 8-inch columbiads fresh from New Orleans foundries, but the battery was supplied with a mere 20 rounds of ammunition each. Meanwhile, the majority of troops deployed by General Lovell below New Orleans were at Chalmette, but the state troops and militia were so badly disciplined that Lovell was hesitant to supply them with arms and ammunition. In the event, defensive preparations in the New Orleans area proved woefully inadequate when the Federal invasion force actually showed up in April. On April 24, Federal warships ran past Forts Jackson and St. Philip on the Mississippi, and after a brief exchange with the Chalmette Battery that exhausted its meager ammunition, pounded the battery with concentrated fire. The Battery crews fled in all directions; the infantry, without ammunition, had stayed out of the way, hiding in nearby woods. The infantry were withdrawn toward Camp Moore; many deserted, and large numbers got seriously drunk. After a generally ignominious defeat of the Louisiana state forces, New Orleans lay helpless before the Union fleet, which entered the city on April 25th (Winters 1963:80, 84, 91, 95-96).

Military action below New Orleans was over with the capture of the city, but wartime conditions played havoc with living conditions in St. Bernard Parish. In many cases, plantation discipline broke down with the proximity of Federal forces. The Federals, however, sought the continuation of sugar production, and sugar planters "loyal" to the U.S. in St. Bernard Parish were able to hire freedmen as plantation laborers to work six ten-hour days a week at a rate of \$10 per day for each adult male and less for women and children. The cost of clothing the laborers could be deducted but the planters had to provide food, housing, and medical care. Provost guards from the Union Army kept peace in the Parish, guarded the loyal planters, and supervised labor relations. This early use of freedmen as wage hands on the sugar plantations appeared to be a success (Winters 1963:146).

The U.S. National Cemetery at Chalmette was laid out in 1864. It eventually contained the graves of over 14,000 Union soldiers (WPA of LA 1940:493-494) and has since had soldiers of other wars buried in it.

The Civil War wrecked the Louisiana sugar industry. Despite successes with Freedman labor during the war, St. Bernard, like other sugar-producing parishes, was hard hit. Several of the larger plantations lay idle and others were abandoned after the war (Din 1988:118). The loss of capital as a result of the war forced many planters to sell their plantations, and many others were foreclosed. The dislocation of the economy made times hard for the lesser planters as well as the Freedmen of St. Bernard, who made up the bulk of the population. Like planters elsewhere in sugar country, some St. Bernard planters converted to rice cultivation because it was a less capital-intensive form of agriculture than growing sugar. However, some planters developed new sugar farms. In 1870, Pierre Ruiz, owner of a tract at La Chinche, constructed a steam sugar mill and evaporator on his plantation. This plantation, later known as Hopedale Plantation, was eventually acquired by Albert Estopinal, owner of Yscloskey Plantation to the west. Evidently, Hopedale Plantation ceased to produce any quantity of sugar by 1900 (Bouchereau 1900-1917; Raby 1980:84).

The Reconstruction-era economy of St. Bernard was not a uniformly dark picture. In 1874, the City of New Orleans forbade stockyards within the city limits. Since the large Crescent City Stockyards & Slaughterhouse Company were located at the lower boundary of the city, the Louisiana State Legislature adjusted the upper boundary of St. Bernard Parish westward to Jackson Barracks. The upper extremity of St. Bernard Parish became known as Stock Landing, Louisiana, and the stockyards were a major business in the Parish well into the twentieth century. Stock Landing was the locale of the first business district and the first bank in St. Bernard Parish (Raby 1980:36, 65).

Transportation resources improved in St. Bernard during the late-nineteenth century. A canal (proposed in 1832), connecting the Lake with the Mississippi River, was finally constructed in the Reconstruction period. By 1871, the project became tainted with scandal and accusations of fraud (Bolding 1969:51). Nevertheless, by 1874, a portion of the Ship Canal from the Mississippi River to Lake Borgne via Bayou Dupré was completed. Bayou Dupré was widened and straightened for much of its length to allow the passage of vessels drawing up to four feet of water (Greene 1982:281). In 1886, the Violet Canal along the old Phillipon Plantation canal to Bayou Dupré was constructed. The St. Louis, New Orleans, and Ocean Canal and Transportation Co. built a twenty-foot-wide lock on the canal with funding from the State of Louisiana. The canal channel could not be kept clear and was abandoned prior to 1900 (Smith 1989:55).

The Mexican Gulf Rail Road line to Shell Beach had been destroyed during the Civil War, and at the end of the century the Louisiana Southern Rail Road constructed a new line in St. Bernard Parish that followed the old Mexican Gulf R.R. right-of-way to St. Bernard station, but then took a new route to Shell Beach. Shell Beach became an increasingly popular resort destination, and was described by Louisiana Commissioner of Immigration William Harris in 1881 as "one of the most beautiful seabathing resorts in the South" (Harris 1881:126). Unfortunately, a severe hurricane in the last years of the nineteenth century wrecked the resort, and although it remained a swimming and fishing spot until the World War II era, Shell Beach did not regain its former level of popularity (Laney 1938:167; WPA of LA 1940:502). The railroad to Shell Beach also remained in use until the World War II era, but the terminus of the Louisiana Southern R.R. became Toca, approximately nine miles west of Yscloskey.

Harris (1881) stated that the inhabitants of St. Bernard raised sugarcane, corn, rice, oranges, some Sea Island cotton, and various vegetables for the New Orleans market. He noted that there were 20 sugar plantations in the Parish and that the Terre Aux Boeufs and Bayou La Loutre

areas were divided into small farms (Harris 1881:126), much as they had been in the period of *Isleño* settlement. In 1890, St. Bernard had 4907 acres in pasture or meadow, 2750 acres in sugarcane, 5000 acres in rice, 2000 acres in corn, 1700 acres in potatoes, 1400 acres in hay, 230 acres in cotton, and 2127 acres in other crops (Claitor's Publishing Division 1975:197). Harris (1881) mentioned neither fishing nor timber harvesting as major activities in St. Bernard Parish. Some of the best cypress within the parish had already been harvested by 1890, but the following decade was one of growth for the timber industry in St. Bernard. This was largely due to developments in the extraction and transportation of logs from cypress swamps. Railroad logging spurs were constructed on several plantations in St. Bernard Parish (Smith 1989:54).

By the end of the nineteenth century, several of the old plantations at the upper end of the Parish adjoining Jackson barracks had been subdivided and named Arabi. A fire destroyed the courthouse during the 1890s and purportedly the community was named after a Middle Eastern pasha whose anti-colonial incendiary activities were in the news at the time. The courthouse was moved at this time from Arabi to St. Bernard on Bayou Terre Aux Boeufs (WPA of LA 1940:489, 499; Raby 1980:65).

In 1904, St. Bernard was described by the Louisiana State Board of Agriculture and Immigration:

Sugar is the chief product; but rice, jute, and garden truck varieties are extensively raised and shipped. The fruits and nuts are oranges, lemons, mandarins, figs, pecans, bananas, grapes, guavas, olives, and prunes. Some few cattle and hogs are raised here. Game consists of becasine, snipe, rice birds, papabots, wild ducks, coons, opossums, squirrels, rabbits, and deer. Fish of fine quality are plentiful; oysters, crabs, and terrapin are also found. The timber is oak, cypress, willow, elm, pine, and gum. There is a small quantity of United States Government land in the Parish, and a very large area of Levee Board lands. Lands are worth from \$1.00 to \$6.00 per acre [LA State Board of Agriculture 1904:75-76].

In 1900, the St. Bernard population was 5,031 persons, with a smaller percentage of African-Americans in the total than on the eve of the Civil War (Goins and Caldwell 1995). During the first four decades of the twentieth century, the St. Bernard Parish population grew slightly over 30 percent, trailing significantly behind the Louisiana average. In 1940, the total Parish population was 7,280 persons. The slow rate of growth was partly the result of African-American outmigration from the parish and state, particularly during the 1910-1920 decade, and a general statewide trend of migration to urban areas (Goins and Caldwell 1995). Many recent Italian immigrants or their second-generation families moved to St. Bernard in the twentieth century, becoming a sizable ethnic presence in the Parish (WPA of LA 1940:499).

Among the major economic developments in St. Bernard Parish in the early-twentieth century was the construction of the American Sugar Refinery in Arabi from 1906 to 1909. The completed facility had a 13-story principal building with 1,300,000 square feet of floor space, 1,500 employees, and six miles of railroad tracks on its 70-acre tract. It was the first major industrial facility in St. Bernard Parish, and for decades it was the largest sugar refinery in the United States and second largest in the world (WPA of LA 1940:490, 495).

The Lake Borgne Canal (or Violet Canal) was enlarged and reopened by the Lake Borgne Canal Co. in 1900-1901. However, in 1923, the Inner Harbor Navigation Canal (or Industrial Canal) was completed, superseding the earlier waterway. The Lake Borgne Canal was subsequently used largely by fish, oyster, and shrimp luggers, until it was closed in 1947 (WPA of LA 1940:490, 495; Jones et al. 1993:66).

During the first decades of the twentieth century numerous "wet prairie" and marsh reclamation projects were undertaken in southern Louisiana. St. Bernard Parish was the locus of several large-scale projects of this kind. Drainage exponent John A. Kruse had begun small reclamation efforts in south Louisiana in the 1880s, at a time when Professor Nathaniel S. Shaler of the U.S. Geological Survey began to focus national attention on the possibility of reclaiming large wetland tracts. However, the real impetus for the Louisiana projects began in the early 1900s. Businessman Edward Wisner became interested in buying up tracts that had reverted to Louisiana from the Federal Government under the Swamp Land Act of 1850, and for which the state had subsequently given title to the various Levee District Boards. Wisner, well aware of reclamation projects in Europe, began accumulating vast holdings, purchasing some wetland tracts for as low as 12½ cents per acre. At Labranche, Wisner drained tracts he had purchased for \$3 to \$4 per acre and sold them at \$150 or more per acre. Within a few years, prices of reclaimed lands were expected to reach \$500 or even \$1,500 per acre; with swamp or marsh lands selling at \$2 to \$20 per acre and reclamation with specialized machinery costing about \$10 to \$15 per acre, the potential profits seemed enormous. By 1909, large expanses of wetland at Paradis, Raceland, and several other points were being drained and dyked (Langworthy 1909:11-15; Kruse 1909).

In St. Bernard Parish, the St. Bernard Land Co. was organized by N.A. Baker & Sons in partnership with Wisner and Dresser. The St. Bernard Land Co. acquired some 120,000 acres along Bayou La Loutre east of Yscloskey; by 1907, the St. Bernard Land Co. had sold 45,000 acres to the Delta Land Co., Ltd., which was organized by several St. Bernard Land Co. stockholders and Chicago investors. However, reclamation efforts seem not to have begun before much of the Bayou La Loutre area was acquired by companies under the leadership of E.L. Chappuis. Chappuis was president of four of the largest reclamation companies operating in St. Bernard Parish: the Louisiana Alluvial Lands Co., the Alluvial City Land Co., the Alluvian Land Co., and the St. Bernard Alluvial Lands Co. (Figure 16). By 1909, Chappuis had hired John A. Kruse as chief engineer of these companies. Kruse had become a nationally-known reclamation authority by 1909, having worked in Drainage District No. 1 in St. Bernard Parish, later known as Subdrainage District C. By 1912, it was planned that the Frisco Rail Road, formerly the Louisiana Southern Railroad, would extend their track from Alluvian Junction, where the track veered north to Shell Beach, along the south side of Bayou La Loutre as far as the proposed location of Alluvian (Figure 17). Alluvial City was to be developed in T13S R15E:29 and 32, not at Alluvian Junction, which is currently referred to as Yscloskey. The railroad extension was evidently never built, and the grand development scheme ended as most did, defeated by eventual ecological problems with drained marsh lands (Gagliano 1973).

The prosperous truck farms of Terre Aux Boeufs were dealt a blow by the mighty Mississippi River in 1922, when a crevasse at Poydras flooded some 70,000 acres. The epic 1927 flood was diverted from wreaking havoc on New Orleans by the creation of an artificial crevasse at Caernarvon, at the lower extremity of St. Bernard Parish's river frontage. After several tons of dynamite finally expanded the crevasse to 2,600' in width, the massive flood waters flowed through the marshes east to Breton Sound (WPA of LA 1940:496).

Despite slow overall population growth, the economic base of St. Bernard Parish was beginning a shift from agriculture to industry that would greatly accelerate after World War II. During the 1920s, the Ford Motor Company constructed an automobile assembly plant in Arabi which employed several hundred workers. The Great Depression led to the closure of the plant in 1932. However, the facility was retained as a parts depot, and by 1940, was the second largest Ford parts distributing center in the United States, with an annual business well over \$1 million. Other large facilities eliminated former sugar plantations in the Arabi-Chalmette area of the Parish in the early decades of the twentieth century. Ten miles of the St. Bernard Parish Mississippi riverfront was included in the port system of New Orleans, and the Chalmette Slip was constructed as a deep-water shipping terminal specializing in the unloading and storage of copra (dried coconut meat) from the Philippine Islands. The Oil Refinery of the Chalmette Petroleum

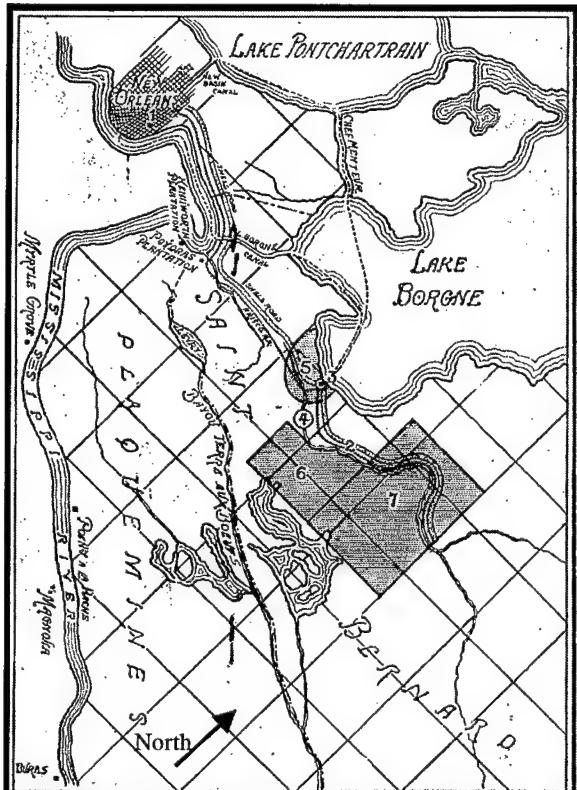


Figure 16. Map from St. Bernard Parish Immigration League (ca. 1907). Original key: 1) General Offices... in City of New Orleans. 2) "Alluvian." 3) Alluvial City. 4) Bayou La Loutre. 5) 6,000 acres owned by Louisiana Alluvial Lands Co. 6) 15,000 acres owned by Alluvial City Land Co. 7) 30,000 acres owned by Alluvian Land Co. No scale available.

the 1950s, farm size in St. Bernard quadrupled as agribusiness enterprises squeezed out the small truck farmers for which the parish had been well known. Fewer than one-third of farm operators in the Parish in 1950 were active a decade later, and farm tenancy virtually ceased. Meanwhile, manufacturing replaced agriculture as the predominant economic activity of St. Bernard. Manufacturing enterprises more than doubled in the post-World War II years, while the value added by manufacturing grew over 1100 percent between 1947 and 1958, to a total of \$97.4 million. By 1965, St. Bernard Parish had the largest aluminum plant (Kaiser Aluminum) and largest sugar plant (formerly the American Sugar Refinery, now Domino Sugars) in the United States, as well as oil refineries and storage facilities, plus packing plants for seafood, vegetables, fruit, and meat and dairy products (Public Affairs Research Council 1965).

St. Bernard Parish population continued to grow strongly after 1960, reaching 66,631 persons by 1990. Between 1940 and 1990, the parish population grew a total of 815 percent, a larger percentage increase than Jefferson and St. Tammany parishes, which were respectively second and third in total growth. However, serious African-American outmigration continued; by 1980, the African-American population of St. Bernard was below 25 percent of the parish total, whereas it had been over 50 percent in 1940. The decline continued and by 1990, the African-American population of St. Bernard Parish was only 3,111 persons, or less than 5 percent of the parish total (Goins and Caldwell 1995).

Company was in operation on the former De La Ronde Plantation tract before 1940, as was a meatpacking plant with an annual capacity of 500,000 sheep and cattle (WPA of LA:490, 495)

The 1950s were a watershed decade for St. Bernard Parish. The economic activity of the Parish in 1940 was still dominated by agriculture. In 1940, 32 percent of St. Bernard's population were employed on the 170 farms in the parish, with sugar, rice, oranges, figs, and pecans the leading crops. Traditional extractive industries such as fishing and trapping were also prominent. However, as discussed above, industrial development had already occurred in St. Bernard to a substantial degree by 1940. Between 1940 and 1950, the population grew by a third, and by 1950, twice as much total acreage in the Parish was in use as farmland as in 1940. During the second half of the 1950s, the economy of the parish was transformed, and it became a manufacturing leader among Louisiana parishes. The population almost tripled, reaching 32,186 persons in 1960, a 342 percent increase since 1940. Also between 1950 and 1960, the number of farms decreased by 34 percent, and farm acreage by 56 percent; tellingly, the farm population plummeted, with only a little over 1 percent of the parish population engaged in agriculture by 1960 (Laney 1938:164-165; Public Affairs Research Council 1965).

Several trends combined to produce this radical change in St. Bernard Parish. Livestock raising, one of the traditional mainstays of agriculture in the parish, dramatically declined. During

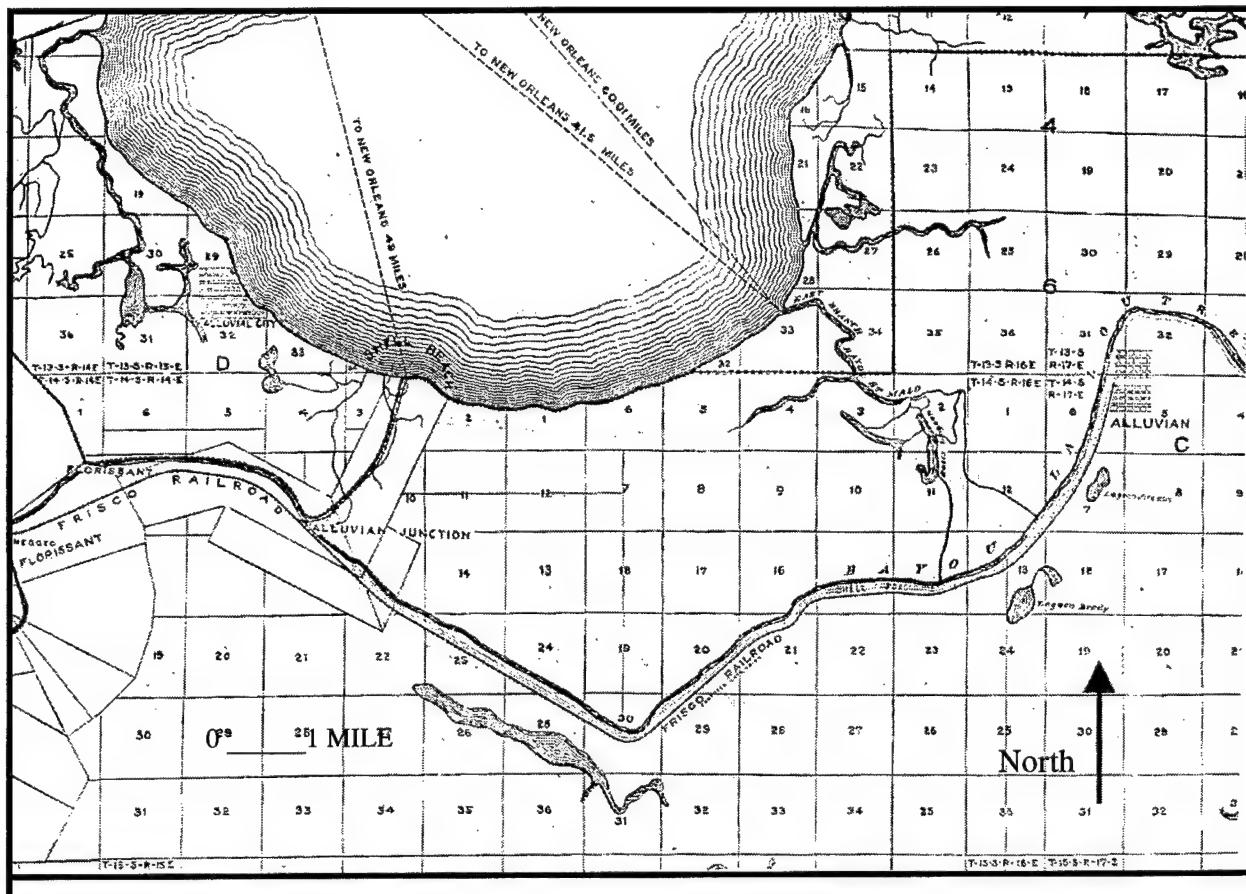


Figure 17. Excerpt from Kruse (1912) showing proposed rail line from "Alluvian Junction" to "Alluvian" following Bayou La Loutre (Louisiana Collection, Howard-Tilton Memorial Library, Tulane University).

By the late-1980s, St. Bernard Parish was producing only about 1 percent of Louisiana agricultural production. Fishing remained a stronger industry, with St. Bernard responsible for about 5 percent of statewide marine fisheries production in the late-1980s, tying it for 7th place among all parishes. In the same period, St. Bernard had a relatively high percentage of population employed in manufacturing and value added by manufacturing, and like other suburban New Orleans parishes, also had relatively high employment in retail trade and significant employment in finance, insurance, and real estate. During the oil bust years of the late-1980s, St. Bernard shared the high unemployment rate of many of the southern Louisiana parishes, but retained the high per capita income level of the suburban New Orleans parishes (Goins and Caldwell 1995).

The impact area for the current project was purchased ca. 1860 by Charles Theodore Chaplain as part of a tract consisting of or including the northeast corner of T14S R16E:30 (COB 20:138, 141, 142, 143; 21:578), which is now Section 37. Chaplain was born in France ca. 1802, and with his wife, Marie Rosalia Catherine Brunot, immigrated to Louisiana sometime between 1835 and 1845. The Chaplains evidently resided at La Chinche during the 1840s, probably somewhere in the vicinity of Yscloskey and Hopedale. By 1854, the Chaplains had moved to "Proctorville," which was probably another name for "Proctor's Landing" or "Proctor's Shell Beach," identified on the Powell Map (Figure 15). Marie Chaplain died at Proctorville in 1860 at age 50 (Bourquard 1987:73).

There is no documentation that any improvements were made to the Section 30 tract during Charles T. Chaplain's ownership. At Chaplain's death (by 1902), his three surviving

children and seven grandchildren received the tract (COB 20:138, 141, 142, 143; 21:578). On July 24, 1909, Millard C. Baker purchased 1/4 interest in the 160-acre Chaplain tract from Francois Chaplain for \$1.00 (COB 21:578), and Baker eventually acquired the remaining interests in the tract (COB 45:150).

During the first two decades of the twentieth century Baker bought a huge amount of land in northern St. Bernard Parish, some from private owners and thousands of acres from the Lake Borgne Basin Levee District. The 6,000-plus acres of Levee District lands purchased by Baker in 1912 were sold to him for 25¢ per acre (COB 24:277). At this time, plans were still afoot to extend the Frisco Rail Road along the southern bank of Bayou La Loutre and develop Alluvian in Townships 13 and 14 South, Range 17 East. Baker formed the St. Malo Improvements Co., Ltd., presumably to reclaim marsh lands for agriculture or other development. It was probably during Baker's ownership that any drainage efforts were first undertaken in the immediate vicinity of the current project area. However, these efforts may have been not fully successful, since on November 27, 1939, Baker and his St. Malo Improvements Co. sold the northeast corner of Section 30 to the Land Investment Co., Ltd., for \$100.00; this price was approximately 75¢ per acre since the area of the tract had decreased to 135 acres (COB 45:150, 151). The Land Investment Co., operators of Hopedale farm, maintained ownership of the former Chaplain tract as part of Hopedale at least as late as the 1950s (Tobin Survey Plats, St. Bernard Parish, n.d.).

## CHAPTER 5

### PREVIOUS INVESTIGATIONS

#### Introduction

The site files located at the Division of Archaeology, Baton Rouge were reviewed prior to the commencement of fieldwork for the current survey. This review revealed four sites (16SB48, 16SB93, 16SB69, and 16SB95) located within 1 mile (1.6 km) of the current project area. Table 2 summarizes these sites as well as several other sites located within the vicinity of the two disposal areas.

Table 2. Sites Located in the Vicinity of the Project Area.					
Site Name and Number	Cultural Affiliation	Description of Material	Survey Methods	NRHP Status	Recorded By
East Bayou (16SB48)*	Baytown, Troyville, Coles Creek	6 bone fragments, 6 ceramic sherds, shell	surface collection, shovel testing	unknown	Treadwell, 1952
Bayou Bernard Canal (16SB93)*	Late-eighteenth/early-nineteenth century	cinder road, construction materials, etc.	surface collection	unknown	Weinstein, 1976
Bayou La Loutre (16SB69)*	Marksville (Magnolia phase), Mississippian (Bayou Petre phase)	1 clay tempered sherd, 1 shell tempered sherd, shell	surface collection	unknown	Weinstein, 1976
Pearstein (16SB95)*	Nineteenth-century farm/rural residence	bottle glass, whiteware, bricks, possible chimney base	unspecified	unknown	Weinstein, Pearson
Proctor Sugar Mill (16SB87)	Nineteenth-century sugar mill	1 brick smokestack, construction materials	unspecified	unknown	Weinstein, 1976
Bayou La Loutre Levee (16SB76)	Neo-Indian (unknown), Mississippian, Historic (unknown)	19 prehistoric sherds, bird bone, glass, brick	surface collection	potentially eligible	Weinstein, 1976
Bayou La Loutre Homes (16SB91)	Late-eighteenth/early-nineteenth century	prehistoric scatter, 3 homes, 1 cemetery	surface collection	not eligible	Weinstein, 1976
MRGO Homes (16SB92)	Late-eighteenth/early-nineteenth century	construction materials, cinder paved roads, house foundation	unspecified	not eligible	Weinstein, 1976
Bakers Ditch (16SB94)	Late-eighteenth/early-nineteenth century	historic artifacts, building materials	surface collection	not eligible	Weinstein, 1976

\*Sites located within 1.6 km (1 mile) of survey area.

#### Kniffen (1936)

The first systematic examination of prehistoric sites in St. Bernard parish, was conducted by Fred Kniffen (1936), a geographer affiliated with the Louisiana Geological Survey. Based on ceramic assemblages from the various sites, he identified the Bayou Cutler and Bayou Petre complexes. He surmised correctly that Bayou Cutler was the earlier of the two (Kniffen 1936:407-422).

Bayou Cutler is now considered to represent an early phase in the Coles Creek period, while Bayou Petre represents a late prehistoric phase of the Mississippi period in the Delta region (Wiseman et al. 1979:4/5). Kniffen (1936:416) noted that, at the time of his writing, a Marksville pottery complex was considered to be the earliest in Louisiana, and that he had recorded no sites representing that complex in St. Bernard Parish.

### **McIntire (1958)**

McIntire (1958) was the next individual to visit a large number of sites in St. Bernard Parish. He did so as part of an effort to date delta lobes and channels in south Louisiana. McIntire identified earlier sites than had Kniffen. These included sites now assigned to the Tchula and Marksville periods (Wiseman et al. 1979:4/8-4/9).

McIntire (1958:Plate 2) visited the area where 16SB39, 16SB40, and 16SB71 are located. He noted that one of these was a beach deposit and two were shell middens. It seems probable that the beach deposit is 16SB71, while the two shell middens represent 16SB39 and 16SB40. McIntire (1958:Plate 12) indicates that the initial occupation at 16SB40 was during the Marksville period, and he collected "Moundville Type," "Pensacola Incised," and "Marksville Incised" ceramics at the site (McIntire 1958:Plate 13). The former two types indicate the site also had a Plaquemine period component.

### **Neuman (1977)**

Neuman (1977) visited many of the sites reported by Kniffen and McIntire. He made new collections and also re-examined some of the previously collected material (Wiseman et al. 1979:4/13).

### **Neitzel (1978)**

Neitzel (1978) conducted a cultural resources survey on the right bank junction of Bottle Bayou and Bayou Terre aux Boeufs for the dredging of a well slip. He visited 16SB57, which was originally reported in 1953 as a *Rangia* midden containing Troyville, Coles Creek, and Plaquemine period pottery. Neitzel (1978) collected 18 pottery sherds within a 15 m x 2 m area along Bayou Terre aux Boeufs. Fifteen of the sherds were classified as Baytown Plain, two were Addis Plain var. *Addis*, and the remaining sherd had unclassified zoned punctated decoration. He recorded the site as 12 cm in depth. Neitzel (1978) interpreted the site as a temporary or seasonal camp occupied sporadically from A.D. 900 to A.D. 1500. He noted that site was located outside of the project impact corridor, and that the site would not be damaged by dredging and spoil deposition.

### **Wiseman et al. (1979)**

Wiseman et al. (1979) systematically surveyed the banks of the Mississippi River Gulf Outlet and some of the surrounding area during the late-1970s. They visited 16SB39, 16SB40, and 16SB71 and provided more detailed information about the sites than had been available previously. In addition, Wiseman et al. (1979:4/1-4/17) provided a detailed history of archeological investigations in St. Bernard Parish.

### **Wicker et al. (1982)**

Wicker et al. (1982) of Coastal Environments, Inc., prepared a wetlands management summary for the St. Bernard Parish Police Jury. The project was undertaken in order to "...prolong existence of the wetlands as a productive and valuable resource which will benefit both the public and private interests of the citizens of St. Bernard Parish and surrounding areas" (Wicker et al. 1982:4).

Five management units were established based on common physical and cultural characteristics. These included the Central Wetlands, Lake Lery, Bayou Bienvenue Proctor Point, and Lower Proctor Point (Wicker et al. 1982:3-6). Twenty-three archeological sites were identified within these five management units. The sites were located by the examination of written accounts of the area, aerial photographs, historic maps and plats, and other records. No fieldwork was conducted for this project.

The current survey is located within Wicker et al.'s (1982) Lower Proctor Point management area. Wicker et al. (1982:77) did not identify any known prehistoric or historic sites within the current survey area.

### **Jones and Franks (1993)**

A cultural resources survey was conducted by Earth Search, Inc., of Mississippi River Gulf Outlet Dredged Material Disposal Areas along and near the south shore of Lake Borgne. Boat survey supplemented by auger testing was conducted throughout most of the project area. All banklines including bayous, a portion of the southern shore of Lake Borgne, well-head access canals, and pipeline and navigation canals were visually inspected (Jones and Franks 1993:69). Systematic 50 m intervals, systematic 200 m intervals, and judgmental auger tests were selectively utilized during survey (Jones and Franks 1993:69).

Excavations were conducted at five sites. Two sites, 16SB71 and 16SB148 consisted of artifacts redeposited on beach ridges (Jones and Franks 1993). The remaining three sites, 16SB39, 16SB40, and 16SB140, had intact deposits ranging from Baytown through Plaquemine. In addition, 16SB39, the largest of the three sites, included six shell mounds (Jones and Franks 1993:85). The three sites, designated the "Shell Beach Bayou Archeological Complex," were recommended as eligible for nomination to the National Register of Historic Places as an archeological district.

## CHAPTER 6 FIELD INVESTIGATIONS

### Introduction

Survey methodology was dictated by the logistics of fieldwork in the marsh environment. Pedestrian survey and shovel testing were conducted within that portion of the project area which was not inundated. This includes the area north of Hwy. 624 and adjacent to Bayou La Loutre. The permanently inundated portions of the project area were surveyed by airboat. All banklines were visually inspected, and auger tests were judgmentally placed.

### Disposal Site 18

Highway 624 comprised the southern boundary of the disposal site. Prairie marsh was encountered approximately 300 m to 325 m north of Hwy. 624, which precluded foot survey in this direction. The eastern boundary consisted of the back dike canal, which provided access to the northern portion of Disposal Site 18 and all of Disposal Site 18a. The western boundary was approximately 3000 ft. west of the pedestrian survey boundary (Figure 1).

A total of 858 shovel tests and 11 auger tests were excavated within Disposal Site 18. Transects were spaced at 25 m intervals and oriented roughly north/south following a bearing of 305°. Extremely dense vegetation required the use of machetes to cut transect lines. Shovel tests along each transect were excavated every 25 m in an offset pattern in order to maximize coverage during pedestrian survey. Shovel tests measured 30 x 30 cm and were excavated to sterile subsoil or a maximum depth of 50 cm below ground surface. Auger tests were excavated to a depth of 100 cm. Excavated soil was screened through 1/4-inch wire mesh whenever possible; soils were carefully trowel-sorted when hand-screening was not feasible.

Evidence of burning was encountered on the surface as well as one to two centimeters below ground surface within the disposal site area. This may be the result of controlled burning in order to improve the habitat for wetland wildlife (Trahan et al. 1989:16). No cultural materials were encountered in any of the shovel tests within Disposal Site 18.

Many shovel tests became inundated prior to reaching 50 cm below ground surface. In particular, shovel tests in the southeast corner of Site 18 from Hwy. 624 to approximately 75 m north were inundated. The inundated area extended approximately 500 m west of the southeast corner of Site 18.

From 500 m west of the southeast corner of Site 18 to the end of the project area along Hwy. 624, three soil profiles were encountered (Figure 18). The first consisted of a 10YR 3/1 (very dark gray) clay which extended to 50 below ground surface (bgs). The second profile exhibited a 10YR 3/1 (very dark gray) clay loam to 20 cm bgs. Beneath this was a 10YR 5/2 (grayish brown) clay to 50 cm bgs. The third profile consisted of a 10YR 3/3 (dark brown) loam to 22 cm bgs followed by a 10YR 5/2 (grayish brown) clay to 50 cm bgs.

Stratigraphy encountered in shovel tests from 75 m north to the intermediate marsh area consisted of a 10YR 4/2 (brown) loam to 5 cm bgs. Beneath this was a 10YR 4/2 (brown) clay with 10YR 5/6 (yellowish brown) mottling which extended to 50 cm bgs (Figure 18). Within the intermediate marsh area, soils included a 10YR 5/2 (grayish brown) wet clay which extended to 50 cm bgs. In addition, a 10YR 2/1 (black) wet loam overlaying a 10YR 4/1 (dark gray) wet clay at 30 cm bgs was encountered in this area (Figure 18). Other shovel tests excavated in the marsh area were inundated.

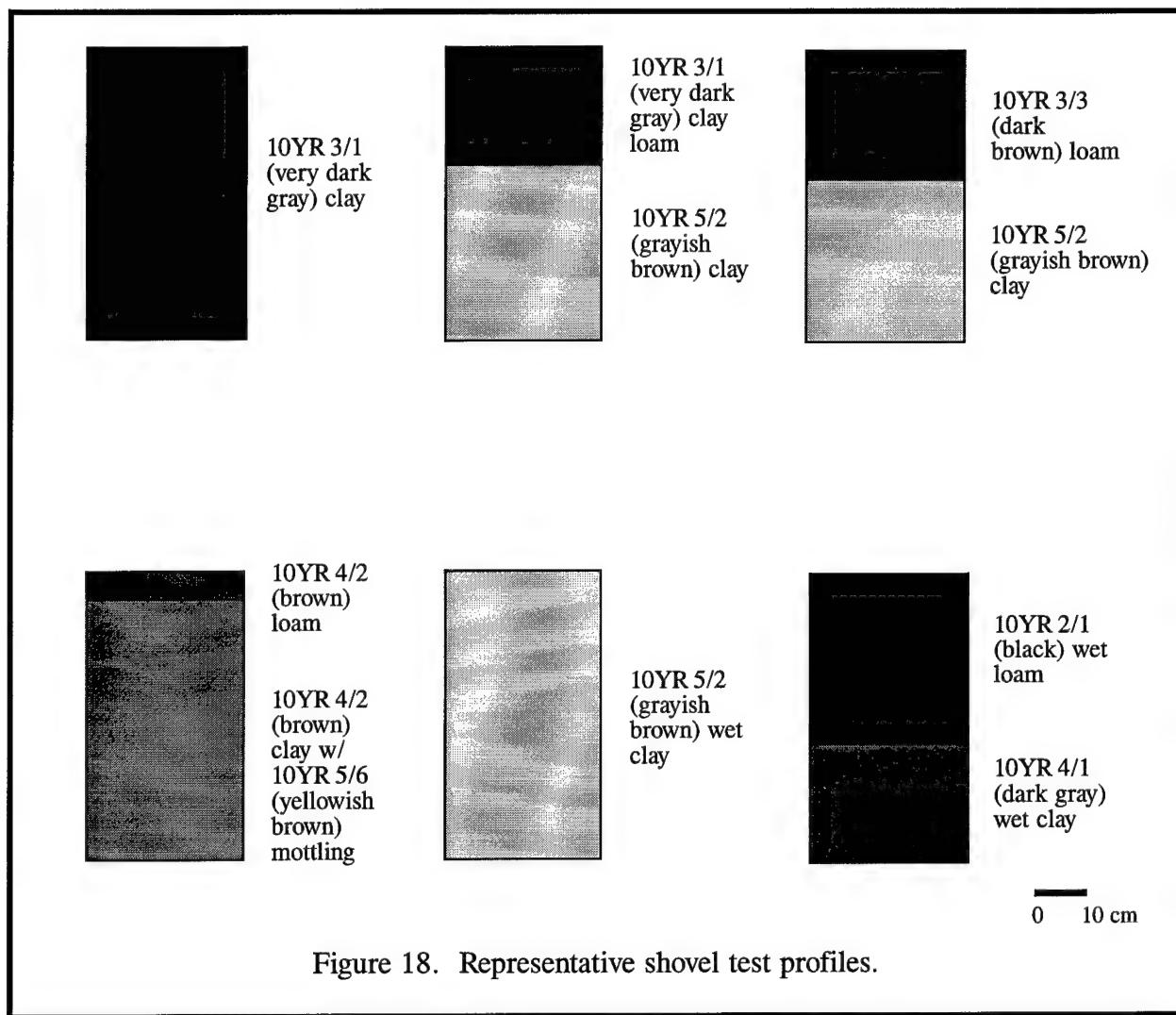


Figure 18. Representative shovel test profiles.

Auger tests extending 200 cm below ground surface were excavated along the extreme western and northern boundary of Site 18 (Figure 2). These tests were placed along the northern boundary of the site area based on elevated terrain features. Table 3 presents the results of the auger tests excavated within Site 18.

Two different stratigraphic profiles were revealed during auger testing (Figure 19). In the first profile, the upper stratum consisted of a 10YR 2/1 (black) clay muck to approximately 15 cm bgs. Beneath this was a N 4/0 (dark gray) clay containing 7.5YR 5/8 (strong brown) concretions to 200 cm bgs. The second stratigraphic profile encountered during auger testing consisted of a N 4/0 (dark gray) clay which extended to approximately 100 cm bgs. This was followed by a 10YR 5/2 (grayish brown) silty clay to 200 cm bgs (Figure 19). No cultural material was encountered during auger testing of Disposal Site 18.

### Disposal Site 18a

Disposal Site 18a was completely inundated and consists entirely of brackish marsh which remains wet throughout the year. An airboat was utilized to access this area. Thirty-five judgmentally placed auger tests were excavated to a depth of 2 meters below ground surface. Auger test locations were determined based on elevated terrain features which consisted solely of

Table 3. Results of Auger Tests in Disposal Site 18.

Auger Test No.	Depth (cm bgs)	Soil Description	Inclusions
1	0-15	10YR 2/1 (black) clay muck	none
	15-200	2.5 YR N4 (dark gray) clay	7.5YR 5/8 (strong brown) concretions
2	0-15	10YR 2/1 (black) clay muck	none
	15-200	2.5YR N4 (dark gray) clay	7.5YR 5/8 (strong brown) concretions
3	0-15	10YR 2/1 (black) clay muck	none
	15-200	2.5YR N4 (dark gray) clay	7.5YR 5/8 (strong brown) concretions
4	0-20	10YR 2/1 (black) clay muck	none
	20-200	2.5YR N4 (dark gray) clay	7.5YR 5/8 (strong brown) concretions
5	0-20	10YR 2/1 (black) clay muck	none
	20-100	2.5YR N4 (dark gray) clay	none
	100-150	2.5YR N4 (dark gray) silty clay	7.5YR 5/8 (strong brown) concretions
6	150-200	2.5YR N4 (dark gray) silty clay	none
	0-100	2.5YR N4 (dark gray) clay	none
	100-200	10YR 5/2 (grayish brown) silty clay	none
7	0-160	2.5YR N4 (dark gray) clay	none
	160-200	10YR 5/2 (grayish brown) silty clay	none
8	0-150	2.5YR N4 (dark gray) clay	none
	150-200	10YR 5/2 (grayish brown) silty clay	none
9	0-130	10YR 2/1 (black) clay muck	none
	130-200	2.5YR N4 (dark gray) clay	none
10	0-100	10YR 2/1 (black) clay muck	none
	100-200	2.5YR N4 (dark gray) clay	none

scrub brush. All auger test locations were recorded using a Magellan GPS 3000 XL hand-held unit with a DBR-2 differential antenna.

Auger tests were placed along the peripheries of Site 18a (Figure 2) where semi-dry land was encountered. The eastern boundary of the project area, which followed the back dike canal, provided the driest location for auger tests. No bankline soil profiles were visible anywhere within the disposal site.

Table 4 presents the results of the auger tests excavated in Site 18a. Three distinct stratigraphic profiles were revealed in these tests (Figure 20). A 10YR 2/1 (black) clay muck to 200 cm bgs was the profile most frequently encountered. A second profile consisted of a 10YR 2/1 (black) clay muck to 100 cm bgs followed by a N 4/0 (dark gray) clay to 200 cm bgs. Four strata were revealed in the final profile encountered. The uppermost stratum was a 10YR 2/1 (black) clay muck to 20 cm bgs. Below this was a 10YR 5/2 (grayish brown) silty clay to 75 cm bgs. This was followed by a 10YR 2/1 (black) loamy muck to 100 cm bgs. The final stratum encountered was a N 5/0 (gray) silty clay muck to 200 cm bgs. No cultural material was revealed during auger testing of Site 18a.

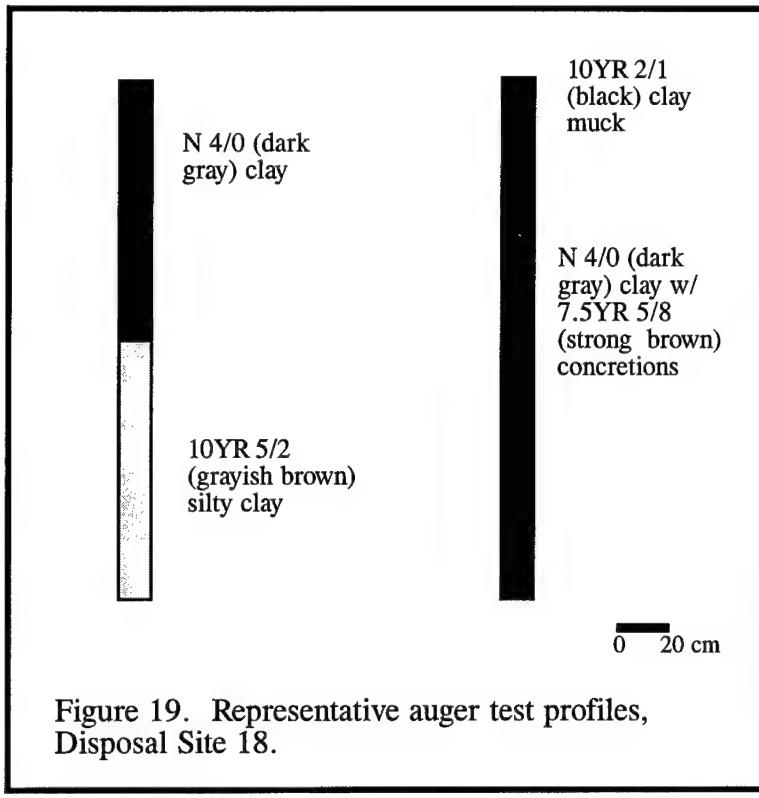


Figure 19. Representative auger test profiles, Disposal Site 18.

remains standing. The area surrounding the smokestack has been cleared and some brick has been replaced along the north side of the chimney. Photographs were taken of the smokestack (Figure 21), but no excavation was undertaken at the site. Given the presence of structural remains and the demonstrated research potential of sugar house complexes (*viz.* Maygarden et al. 1994), the site should be considered potentially eligible for nomination to the National Register of Historic Places.

### Proctor Sugar Mill (16SB87)

Although beyond of the scope of work for the current project, site 16SB87, the Proctor Sugar Mill, was visited during field investigations because scheduling permitted it. The Proctor Sugar Mill is located approximately 1.2 miles outside of the current survey area. The site was investigated by Weinstein in 1976 and was described as being badly collapsed and heavily overgrown. The site's National Register status was assessed as unknown.

The sugar house was part of Hopedale Plantation. The current survey area includes the cultivated fields for that estate (Mr. Campo, personal communication to Braud, 1998; see also Chapter 4). One smokestack associated with the nineteenth-century sugar mill still re-

stays standing. The area surrounding the smokestack has been cleared and some brick has been replaced along the north side of the chimney. Photographs were taken of the smokestack (Figure 21), but no excavation was undertaken at the site. Given the presence of structural remains and the demonstrated research potential of sugar house complexes (*viz.* Maygarden et al. 1994), the site should be considered potentially eligible for nomination to the National Register of Historic Places.

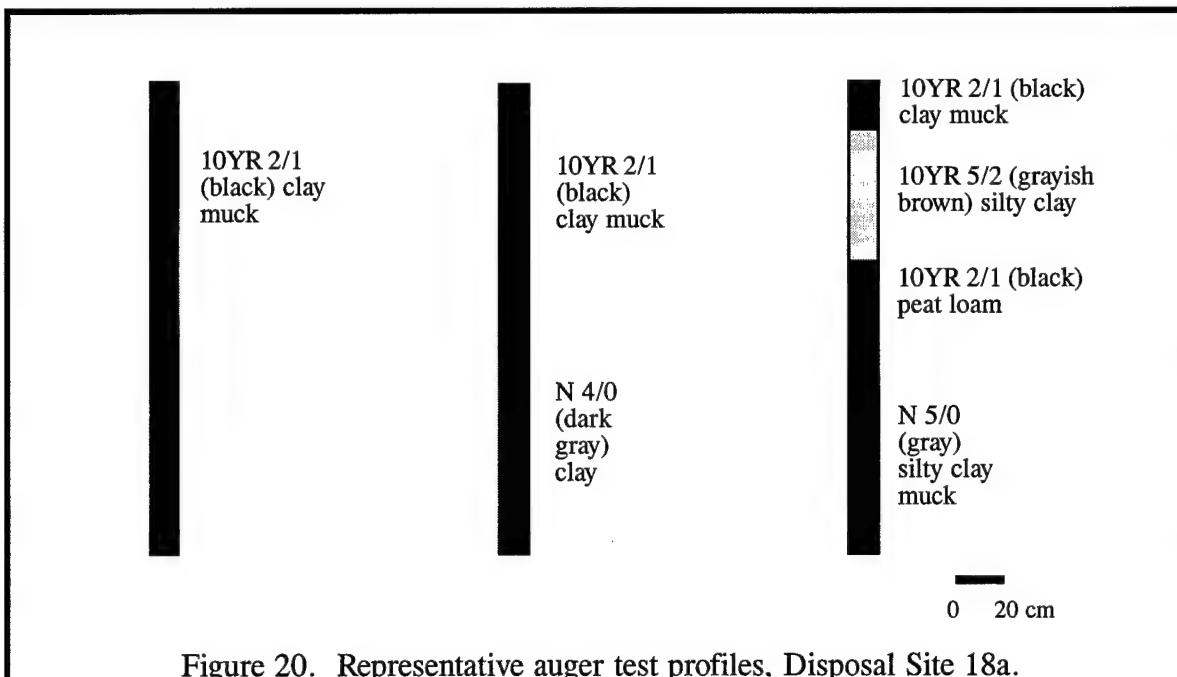


Figure 20. Representative auger test profiles, Disposal Site 18a.

Table 4. Results of Auger Tests in Disposal Area 18a.

Auger Test No.	Depth (cm bgs)	Soil Description	Inclusions
1	0-200	10YR 2/1 (black) clay muck; water at 22 cm	none
2	0-200	10YR 2/1 (black) clay muck; water at 20 cm	none
3	0-200	10YR 2/1 (black) clay muck; water at 25 cm	none
4	0-200	10YR 2/1 (black) clay muck; water at 20 cm	none
5	0-200	10YR 2/1 (black) clay muck; water at 20 cm	none
6	0-150	10YR 2/1 (black) clay muck	none
	150-200	2.5YR N4/0 (dark gray) clay	none
7	0-110	10YR 2/1 (black) clay muck	none
	110-200	2.5YR N4/0 (dark gray) clay	none
8	0-100	10YR 2/1 (black) clay muck	none
	100-200	2.5YR N4/0 (dark gray) clay	none
9	0-100	10YR 2/1 (black) clay muck	none
	100-200	2.5YR N4/0 (dark gray) clay	none
10	0-200	10YR 2/1 (black) clay muck	none
11	0-190	10YR 2/1 (black) clay muck	none
	190-200	2.5YR N4/0 (dark gray) clay	none
12	0-120	10YR 2/1 (black) clay muck	none
	120-200	2.5YR N4/0 (dark gray) clay	none
13	0-100	10YR 2/1 (black) clay muck	none
	100-200	2.5YR N4/0 (dark gray) clay	7.5YR 5/8 (strong brown) concretions
14	0-175	10YR 2/1 (black) clay muck	none
	175-200	2.5YR N4/0 (dark gray) clay	7.5YR 5/8 (strong brown) concretions
15	0-140	10YR 2/1 (black) clay muck	none
	140-200	2.5YR N4/0 (dark gray) clay	7.5YR 5/8 (strong brown) concretions
16	0-150	10YR 2/1 (black) clay muck	none
	150-200	2.5YR N4/0 (dark gray) clay	7.5YR 5/8 (strong brown) concretions
17	0-190	10YR 2/1 (black) clay muck	none
	190-200	2.5YR N4/0 (dark gray) clay	none
18	0-150	10YR 2/1 (black) clay muck	none
	150-200	2.5YR N4/0 (dark gray) clay	none
19	0-100	10YR 2/1 (black) clay muck	none
	100-200	2.5YR N4/0 (dark gray) clay	none

Table 4, Continued.

Auger Test No.	Depth (cm bgs)	Soil Description	Inclusions
20	0-170	10YR 2/1 (black) clay muck	none
	170-200	2.5YR N4/0 (dark gray) clay	none
21	0-200	10YR 2/1 (black) clay muck	none
22	0-200	10YR 2/1 (black) clay muck	none
23	0-200	10YR (black) clay muck	none
24	0-200	10YR 2/1 (black) clay muck	none
25	0-10	10YR 2/1 (black) clay muck	none
	10-200	2.5YR N4/0 (dark gray) clay	none
26	0-10	10YR 2/1 (black) clay muck	none
	10-90	2.5YR N4/0 (dark gray) dense clay	none
	90-200	2.5YR N4/0 (dark gray) silty clay	none
27	0-200	10YR 2/1 (black) clay muck	none
28	0-200	10YR 2/1 (black) clay muck	none
29	0-200	10YR 2/1 (black) clay muck	none
30	0-40	10YR 2/1 (black) clay muck	none
	40-200	2.5YR N4/0 (dark gray) silty clay	none
31	0-200	10YR 2/1 (black) clay muck	none
32	0-20	10YR 2/1 (black) clay muck	none
	20-75	2.5YR N5/0 (gray) silty clay	none
	75-100	10YR 2/1 (black) loamy muck	none
	100-200	2.5YR N5/0 (gray) silty clay muck	none
33	0-100	10YR 2/1 (black) clay muck	none
	100-200	2.5YR N5/0 (gray) clay	none
34	0-110	10YR 2/1 (black) clay muck	none
	110-200	2.5YR N5/0 (gray) clay	none
35	0-5	10YR 2/1 (black) clay muck	none
	5-200	2.5YR N4/0 (dark gray) clay	none

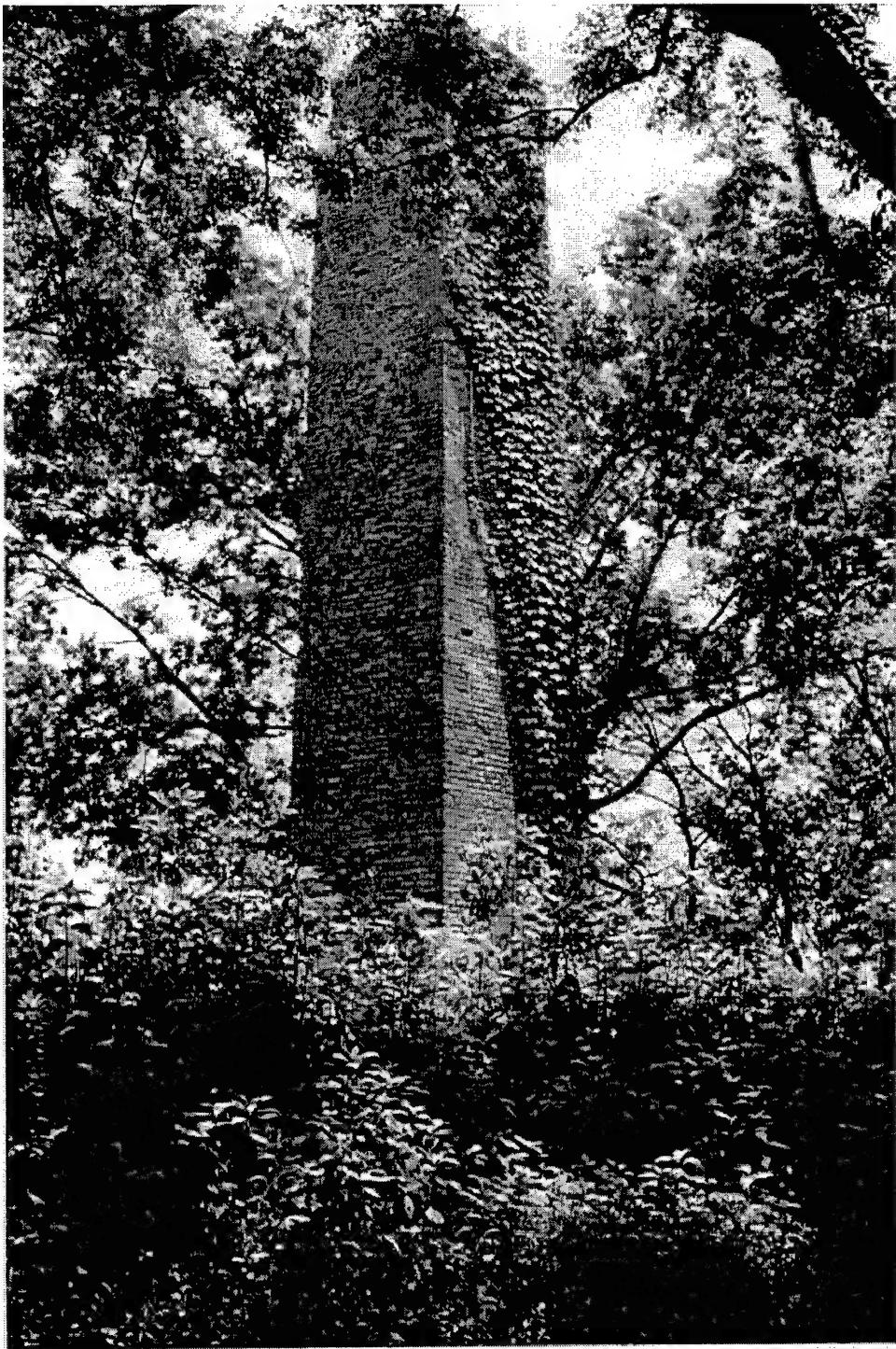


Figure 21. The Proctor sugar house smokestack.

## **CHAPTER 7** **RECOMMENDATIONS**

Cultural resources investigations were undertaken in two dredged material disposal areas of the Mississippi River Gulf Outlet in St. Bernard Parish. A portion of Site 18 was surveyed using systematic shovel tests to locate cultural resources. The remainder of Site 18 and all of Site 18a were accessed by airboat, and auger tests were judgmentally placed in the marsh. A visual inspection of all exposed banklines was also conducted. No cultural remains were encountered during survey of Disposal Sites 18 and 18a. No historic or prehistoric archeological sites will be impacted by the planned disposal of dredge material. No further work is recommended.

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Tobin Survey Plats

## **APPENDIX 1**

**SCOPE OF SERVICES**

Cultural Resources Survey of the  
MRGO Dredged Material Bayou la Loutre Disposal Areas,  
St. Bernard Parish, Louisiana

**1. Introduction.** The archeological survey to be performed under this delivery order is to provide an inventory of cultural resources located along two dredged material disposal areas of the Mississippi River Gulf Outlet in St. Bernard Parish. These disposal areas include sites 18 and 18a. Dredged material is scheduled to be deposited in these areas later this year to help nourish and recreate the marsh environment. The disposal sites have not been systematically surveyed for cultural resources. Any archeological site located within the project area may be adversely affected by the deposition of dredged material.

**2. Study Area.** The study area consists of two disposal areas located in Township 14 South and Ranges 15 and 16 East as shown on the attached maps. These disposal areas are designated Disposal Area 18 and Disposal Area 18a.

**3. Background Information.** A cultural resources survey was conducted of the entire Mississippi River Gulf Outlet in 1979. This survey covered existing disposal areas on the right descending (west) bank of the channel. Recently, the Corps of Engineers has focused its efforts on depositing dredged material in areas, which would benefit the marsh by replenishing the soils in highly erosive areas. The above two disposal areas selected for these purposes have not been surveyed systematically for cultural resources. A review of the Louisiana Division of Archaeology site files indicates that several previously identified archaeological sites exist along the banks of Bayou La Loutre within a few miles of these two disposal areas (16SB69, 16SB89, 16SB95, 16SB94, 16SB93, 16SB92, 16SB91 and 16SB76). While the majority of these sites are 19th Century historic house sites, there is a high potential for finding prehistoric sites as well. Only one of the above referenced sites is identified as a prehistoric shell midden. A cultural resource survey of both disposal areas is necessary to determine the presence or absence of additional cultural resources.

**4. General Nature of the Work.** This study will consist of background research, intensive cultural resource survey of the disposal areas, data analysis and report preparation. The disposal area and the land along side of the disposal area will be examined as well as the high probability areas for archaeological sites such as areas along Bayou la Loutre and the relict ridges will be investigated.

**5. Study Requirements.** The study will be conducted utilizing current professional standards and guidelines including, but not limited to:

\* The National Register Bulletin 15, "How to Apply the National Register Criteria for Evaluation;

\* The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation as published in the Federal Register on September 29, 1983;

\* The Louisiana Division of Archaeology's Comprehensive Archeological Plan dated October 1, 1983 and the Cultural Resources Code of Louisiana, June 1980.

\* The Advisory Council on Historic Preservation's regulation 36 CFR Part 800 entitled, "Protection of Historic Properties."

The study will be conducted in three phases: historical research, pedestrian survey and the Data Analysis and Report Preparation.

Phase 1: Historical Research. The study shall begin with a comprehensive literature search and records review prior to the start of field investigations. This will include, but may not be limited to the following: 1) review of all available historic maps and aerial photographs; 2) examination of local and regional historic archives and public records; 3) a review of the State of Louisiana's archaeological site files; 4) a review of the National Register of Historic Places files; 5) a review of the geomorphological data and reports; and 6) a review of past cultural resource reports and records. The literature search and records review will determine the location of known cultural resources and the potential for such resources within the project area. The analysis of this material will be instrumental in the determination and identification of high probability areas such as distributary channels, beach ridges and elevated natural levees. At a minimum, the background research and records review will be sufficient for developing the historic context of the study area. It shall also provide enough information to predict the nature of the cultural resources in the project area and should be to a level sufficient for assessing the significance of any sites recorded as a result of the field investigations. A detailed chain of title for the study area is not required for this study. In addition to the literature and record reviews, the Contractor shall consult individuals who are knowledgeable about the history of the project area.

Phase 2: Cultural Resources Survey. The field investigations of the project area will begin following completion of Phase 1. Field methodology and techniques will follow acceptable professional standards (see Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation, and Federal Register, September 29, 1983). Project specific services are as follows:

Phase 2 will involve a pedestrian survey of the two disposal areas. A shallow water boat or airboat may be necessary to access all areas of the project area. Sections of the project area are inundated and therefore not feasible for terrestrial survey. Therefore the survey shall be a combination of boat survey and intensive pedestrian survey with auger/shovel testing. The boat/air boat survey will be utilized in those portions of the project area, which are only accessible by water. This will involve visual inspection of the stratigraphic profile of any exposed banklines as well as auger and shovel testing.

The survey is limited to those portions within the project area, which have a high potential for sites, provide subsurface information in their banks, or are amenable to pedestrian survey methods. Auger testing and/or shovel testing will be conducted to determine the presence or absence of buried cultural deposits. Shallow water and marsh areas can be tested through a combination of probing and hand auguring. Field methodology and techniques will follow acceptable professional standards.

Where accessible, the pedestrian survey will be conducted along parallel transects spaced 25 meters apart. Shovel and/or auger tests will be placed along these same transects at 25 meter intervals. Shovel and or auger test intervals in adjacent transects will be staggered or offset to maximize coverage.

This systematic procedure will be supplemented with judgmental shovel testing where the background research or field observations indicate high probability geomorphic features, archaeological, or historic sites. The geomorphic data indicates that the natural levee along Bayou la Loutre and the relict ridges in this area may be subsided. Shovel tests will be approximately 30x30 cm in the horizontal plane and approximately 25-50 cm deep, i.e. to sterile subsoil. The excavated soil will be screened through 1/4-inch wire mesh. Each site located will be tested by the placement of at least 1 by 1 square meter unit to determine its horizontal and vertical dimensions, its integrity and if possible its cultural affiliation. One soil profile will be drawn for each unit excavated. Additional profiles should be drawn for more complex stratigraphy. Test units will be excavated and screened through 1/4-inch wire mesh.

All human remains and/or burials and associated artifacts shall be left undisturbed. Upon discovery the project archaeologist will be notified immediately.

One week after completion of fieldwork, a management summary will be submitted to the technical representative for this project.

All sites located in the survey corridors will be mapped, and photographed. At a minimum, site maps will show site boundaries, locations of features and artifact scatters locations of all subsurface testing units, and prominent natural and cultural

features in the site area. All shovel/auger tests and excavation units will be immediately backfilled upon completion of archeological recordation.

For all sites discovered during the survey, the Contractor will file state site forms with the Louisiana Division of Archaeology and cite the resulting state-assigned site numbers in all draft and final reports. In addition, the Contractor will submit site update forms to the Division of Archaeology for all previously recorded sites. These forms will correct previously filed information where appropriate and summarize the results of the present investigation. All sites located within the project area will be recorded to scale on the appropriate 7.5 minute quadrangle and aerial mosaic project maps. The quadrangle maps will be utilized to illustrate the site forms. One copy of the aerial mosaic project maps, marked with the locations of all sites and historic structures in the project easement, and two unbound copies of each site and site update form will be submitted to the COR with the draft report.

If any standing structures are located in the survey area they will be identified by function, dated and described in standard terminology of formal and/or vernacular architecture, as appropriate. Each structure predating 1945 or of potential National Register eligibility will be recorded on Louisiana state standing structure forms accompanied by a minimum of three black and white photographs showing front, back and side views of the structure. The Contractor will determine whether subsurface features are present. If present, the structure and features will be treated as a site and documented accordingly. The Contractor shall assess the significance, i.e. the National Register eligibility, of all standing structures. Two copies of all standing structure forms will be submitted with the draft report.

Phase 3: Data Analyses and Report Preparation. All data will be analyzed using currently acceptable scientific methodology. The Contractor shall catalog all artifacts, samples, specimens, photographs, drawings, etc., utilizing the format currently employed by the Louisiana Division of Archaeology. The catalog system will include site and provenience designations. A detailed analysis of faunal material recovered is beyond the scope of this delivery order. However, the contractor shall provide a descriptive overview of the faunal collection, in addition to weight and quantity data. All cultural resources located by the survey will be evaluated against the National Register criteria contained in Title 36 CFR Part 60.4 and within the framework of the historic setting to assess the potential eligibility for inclusion in the National Register. The Contractor will classify each site as eligible for inclusion in the National Register, potentially eligible, or not eligible. The Contractor shall fully support his recommendations regarding site significance. For those sites considered worthy of additional testing, the Contractor will recommend a specific

testing scheme. The Contractor shall also recommend appropriate mitigation measures for all sites classified as eligible.

The analyses will be fully documented. Methodologies and assumptions employed will be explained and justified. Inferential statements and conclusions will be supported by statistics where possible. Additional requirements for the draft report are contained in Section 6 of this Scope of Services.

#### 6. Reports:

a. Phase 1 Management Summary. Two copies of a brief management summary which presents the results of the Phase 1 investigations will be submitted to the COR within 1 week after completion of Phase 1 fieldwork for review and approval. This report will include a brief description of each site recorded during the survey, assessments of National Register eligibility and detailed recommendations, for site avoidance or data recovery, if avoidance is not feasible. For any site recommended as eligible for inclusion in the National Register, the contractor shall carefully define the minimum "no work area" necessary to avoid project impact. In addition, the Contractor shall assess the potential impact of placing dredged material on or near the site(s).

b. Draft and Final Reports (Phase 1-3). 4 copies of the draft report integrating all phases of this investigation will be submitted to the COR for review and comment within 12 weeks after task order award. Along with the draft reports, the Contractor shall submit:

(1) One copy of the aerial mosaic project maps, marked with the locations of all sites and standing structures in the project easement.

(2) Two unbound copies of each site, site update, and standing structure form.

The written report shall follow the format set forth in MIL-STD-847A with the following exceptions:

(1) Separate, soft, durable, wrap-around covers will be used instead of self covers;

(2) Page size shall be 8-1/2 x 11 inches with 1-inch margins;

(3) The reference format of American Antiquity will be used. Spelling shall be in accordance with the U.S. Government Printing Office Style Manual dated January 1973.

The COR will provide all review comments to the Contractor within 2 weeks after receipt of the draft reports (14 weeks after work item award). Upon receipt of the review comments on the draft report, the Contractor shall incorporate or resolve all comments and submit one preliminary copy of the final report to the COR within 1 weeks (15 weeks after task order award). Upon approval of the preliminary final report by the COR, the Contractor will submit 30 copies and one reproducible master copy of the final report to the COR within 17 weeks after work item award. The

Contractor will also provide computer disk(s) of the text of the final report in Microsoft Word or other format. Included, as an appendix to the Final Report will be a complete and accurate listing of cultural material and associated documentation recovered and/or generated. In order to preclude vandalism, the final report shall not contain specific locations of archeological sites. Site specific information, including one set of project maps accurately delineating site locations, site forms, black and white photographs and maps, shall be included in an appendix separate from the main report.